

# *Operator's Guide*

# AST

*Premmia*  
**GL Series**

***Disclaimer***

Although this guide has been carefully checked for accuracy, there may have been changes to the design and specification of the computer since the guide was printed. There are no warranties as to the accuracy of the information in this guide, and AST cannot be responsible for any inaccuracies or omissions.

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As an ENERGY STAR® Partner,  
AST Computer has determined that this  
product meets the ENERGY STAR®  
guidelines for energy efficiency.

## Important Safety Instructions

For your protection and safety, please read these instructions thoroughly and pay strict attention to and follow all warnings and instructions.

1. Before cleaning the computer and monitor, be sure to disconnect them from AC power. Do not use any liquid or spray cleaners - wipe with a damp cloth only.
2. Do not use the computer if the environment you are working in is wet or overly damp.
3. The computer can only be operated within the voltage range specified on the power rating label. For information on the voltage range in your area, contact your electrical utility company.
4. The AC power cable should only be used to connect your computer to an electrical power supply. Make sure the outlet is easily accessible.
5. Unplug the computer from the wall outlet and refer servicing to qualified service personnel under the following conditions:
  - A. When the power cord is damaged.
  - B. If liquid has entered the computer.
  - C. If the computer does not operate normally when the operating instructions are followed. Adjust only those controls that are covered by the operating instructions. Improper adjustment of other controls may result in damage and often requires extensive work by a qualified technician to restore the computer to normal operation.
  - D. If the computer has been dropped or damaged.
  - E. If the computer exhibits a distinct change in performance.
6. Do not use CD or DVD disks that are not perfectly round or are otherwise unbalanced. Due to the very high rotation speeds inside the CD and DVD drives, an unbalanced disk can cause vibration and malfunctions.

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## **An Overview**

Your computer combines high-performance components in a design that meets multiple industry standards and supports most common operating systems (for example Microsoft® Windows 98® and Windows NT®) and applications (for example Microsoft Word or Excel, Internet browsers and email programs).

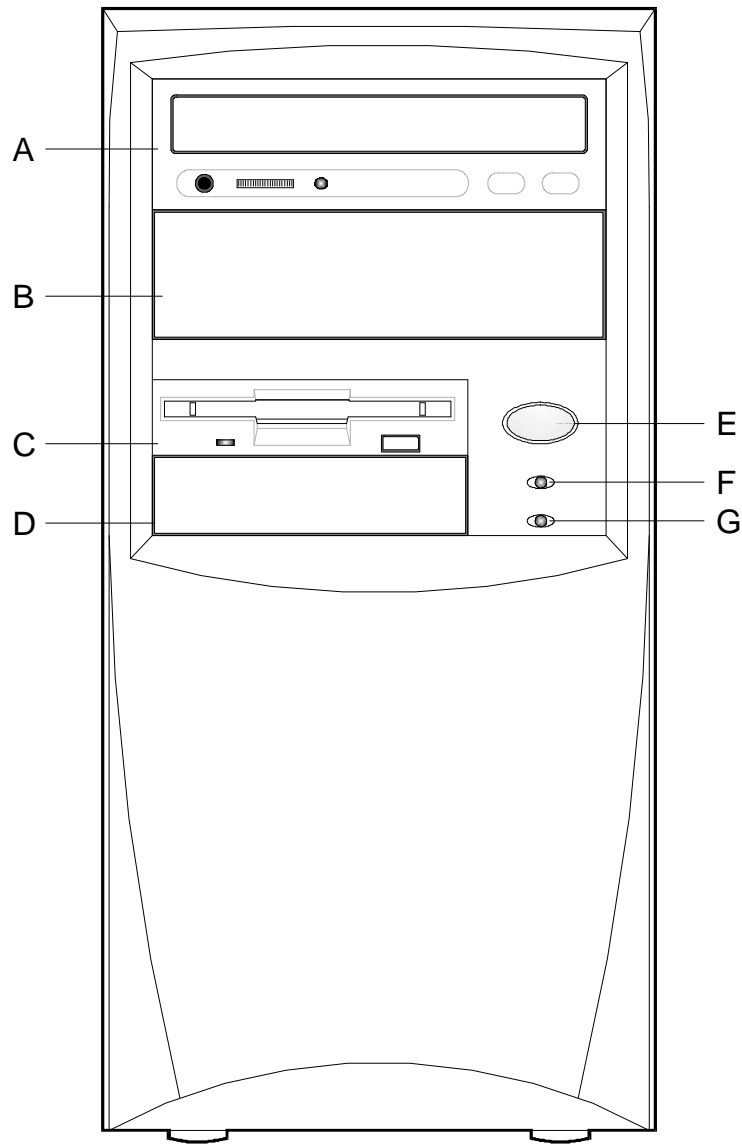
Getting the most out of your computer requires a good understanding of how the features of the computer work with the operating system and with applications. You should spend a few moments to review this user guide to get an idea of what your computer can do, as well as checking out the operating system and applications manuals to see how they work together.

The next few pages gives you a quick tour of the computer; the following sections have a more in-depth description of each feature.



## ***The Front of the Computer***

{xe "Diskette drive"}{xe "Floppy diskette" \t "See Diskette drive"}{xe "CD-ROM drive"}{xe "DVD drive"}{xe "CDR-W drive"}{xe "Optical drive"}{xe "Reset button"}{xe "Front panel"}{xe "Drive bays"}{xe "Hard disk drive:LED"}{xe "Device bays"}{xe "Suspend mode"}{xe "Power LED"}{xe "Power button"}{xe "LS-120 drive" \t "See SuperDisk drive"}{xe "Zip drive"}

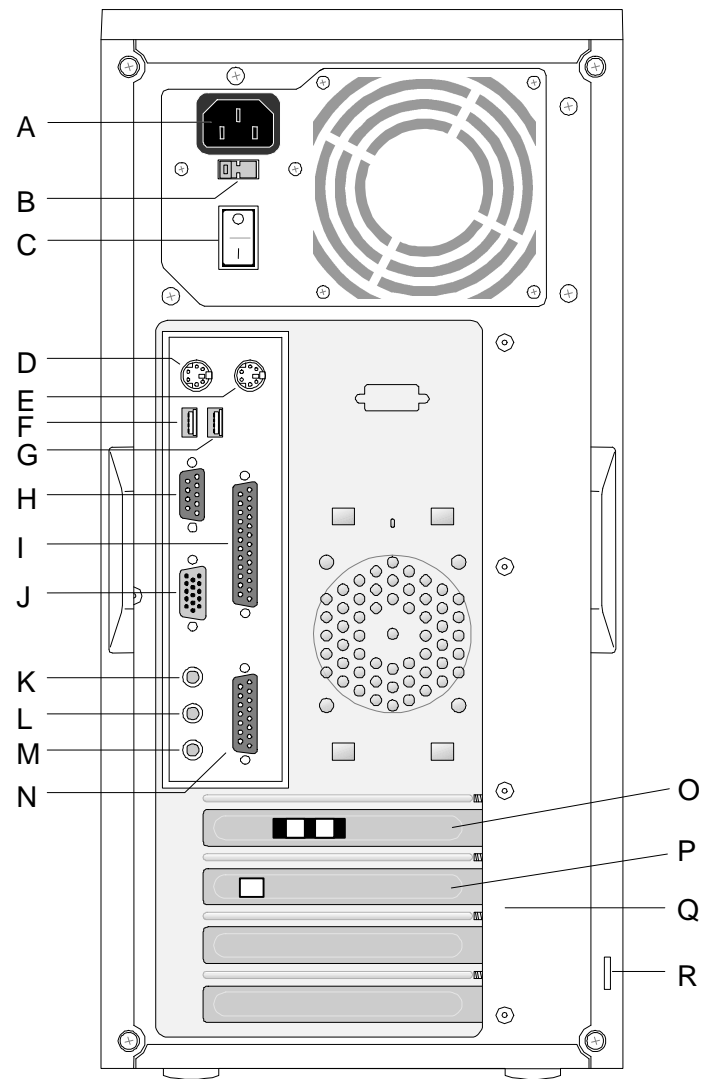


A B	5.25" device bays	These bays may contain one or more optical drive (CD-ROM, DVD or CD-RW drive). See page 31 for more details on optical drives and page 47
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		for details on installing devices in these bays.
C	3.5" diskette drive	A standard diskette drive or a SuperDisk™ drive, see page 28 for more details.
D	3.5" device bay	If you ordered a Zip™ drive with your computer, it will be installed here; see page 39 for more details on using a Zip drive.  See page 47 for details on installing a drive here.
E	Power button	Use this to turn the computer on, turn it off, and put it into power-saving Standby mode; see page 22 for more details.
F	Power LED	Lights when the computer is turned on, flashes when the computer is in power-saving Suspend mode.
G	Hard drive LED	Lights when the hard disk is being accessed, do not turn off or reset the computer when this is lit.

## ***The Back of the Computer***

{xe "AC voltage switch"}{xe "AC connector"}{xe "PS/2"}{xe "Mouse"}{xe "Keyboard"}{xe "USB"}{xe "Serial ports"}{xe "Parallel port"}{xe "Printer port"}{xe "Video:port"}{xe "Graphics port"}{xe "Game port"}{xe "Audio"}{xe "Microphone"}{xe "Speaker port"}{xe "Option cards"}{xe "MIDI port"}{xe "Padlock"}{xe "Security:Padlock"}{xe "MIDI port"}{xe "Modem"}{xe "Network card"}{ XE "LAN:card" }



A	AC power inlet	Connect the AC cable here.
B	AC voltage selection switch	Use this to set up the computer to accept 110V or 220V AC power; see page 17 for more details.
C	Power enable switch	This must be in the on (1) position to enable the computer to power on.
D	Keyboard port (purple)	Connect the keyboard here; see page 29 for more details.
E	Mouse port (green)	Connect the mouse here; see page 29 for more details.
F G	USB ports	Connect USB devices here; see page 38 for more details.
H	Serial port (teal)	Connect serial devices here; see page 37 for more details.
I	Parallel port (burgundy)	Connect parallel devices, such as a printer here; see page 34 for more details.
J	Video (blue)	Connect your monitor here; see page 38 for more details.
K	Audio output (lime)	Connect your speakers here; see page 27 for more details.
L	Audio input (light blue)	Connect external audio sources, such as a radio or VCR here; see page 27 for more details.
M	Microphone input (pink)	Connect an external microphone here; see page 27 for more details.
N	MIDI/Game port (gold)	This port can be used to connect a joystick/gaming device or a MIDI audio device; see page 29 for more details.
O	Modem card	This optional card is used to connect to a telephone line; see page 30 for more details.
P	Network card	This optional card is used to connect to a local area network; see page 31 for more details.
Q	Option card slots	Used to add option cards; see page 54 for more details.
R	Padlock loop	Use this to restrict access inside your computer; see page 35 for details.

## **Ergonomic Considerations{x e "Ergonomics"}{x e "Carpal Tunnel Syndrome"}**

Any physical activity, repeated frequently over a long period of time, may pose a risk of serious injury. Some nerve, tendon and muscle disorders may be associated with repetitive activities, improper work environments and incorrect work habits. Although some studies have shown an association between long-term use of a keyboard and the development of nerve, tendon and muscle disorders such as Carpal Tunnel Syndrome, it is still unclear whether working at a computer causes these disorders.

We've designed your computer to be as easy to use as possible, but please follow the guidelines in this section to reduce the risk of injury.

If you do experience pain, tenderness, swelling, burning, cramping, throbbing, weakness, soreness, tingling and/or numbness anywhere in your body, please contact a doctor. If you do have to work on your computer for long periods of time, make sure you vary your tasks throughout the day, and take frequent breaks - get up and stretch, walk around.

### ***Arrange Your Work Environment***

Arrange your work environment so that you are working in an easy and relaxed position.

#### **Get Seated**

Adjust your chair according to the following guidelines:

- Keep your body in a relaxed, upright position; make sure the back of your chair supports the inward curve of your back.
- Use the entire seat and backrest to support your body. The angle between your back and thighs should be 90° or greater.
- Place your feet flat against the floor. Extend your lower legs slightly so that the angle between your upper and lower legs is greater than 90°.

## **Typing**

When you use the keyboard, follow these guidelines:

- Adjust your seat height so that your elbows are near to your body and your forearms are parallel to the floor. If your chair has armrests, try and use these to support your arms.
- Type with your wrists straight and your hands floating above the keyboard. Lower your wrists only between typing to rest them.
- Try to avoid bending your wrists, hands or fingers sideways; if you have to press a hard-to-reach key, move your entire arm.
- Keep your shoulders, arms, wrists and hands relaxed. Type gently; don't bang the keys.

## **Viewing the Monitor**

Use the following guidelines to reduce eye, shoulder and neck stress:

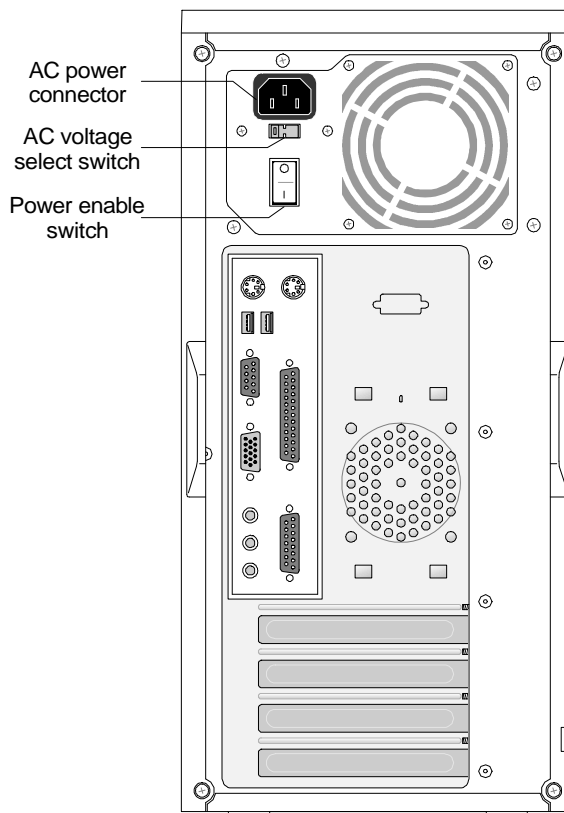
- Position the screen so that it is at 90° to windows, ceiling lights or other light sources.
- Adjust the brightness and contrast to enhance readability.
- Set up the resolution and icon and font sizes so that you can read things easily.
- Clean the screen regularly.
- Rest your eyes periodically by focusing on an object at least 20 feet away. Blink often.



## Turning the Computer On and Off

### ***Powering the Computer{xe "AC voltage switch"}{xe "AC connector"}{xe "Power supply"}***

On the back of your computer, just below the AC power connector, is the AC voltage select switch. The switch has two settings, depending on the AC supply: 115 VAC (from 100 to 127 VAC) and 230 VAC (from 200 to 240 VAC). Check with your utility company for the correct range for your area.



Plug one end of the AC cable into the wall outlet and the other end in to the AC power connector.

Make sure the Power enable switch is in the on (1) position.

## ***Turning On the Computer******{xe "Turning on the computer"}{xe "POST"}***

The back of your computer has a lot of ports that you can use to connect external devices such as the keyboard and mouse, printers, scanners and so on. However, the only ports to which you can connect external devices when the computer is turned on are the two USB ports. Devices that use other ports must be connected before you turn on the computer; if you connect these external devices to the computer when it is turned on, you risk damaging both the computer and the device.

You should also turn on external devices before you turn on the computer.

There are several ways to turn on the computer:

- by pressing the Power button on the front panel
- by pressing a key or entering a password on the keyboard
- by pressing a mouse button
- using an optional network or modem card.

When the computer is turned on, the green power LED on the front panel lights and the computer runs a series of Power-On Self Tests (or POST) to make sure everything is OK. After that the operating system is started.{xe "Power LED"}

## ***Using the Keyboard or Mouse to Turn On the Computer***

You can set up the computer so that it will turn on whenever a key on the keyboard is pressed, or you can set a power-on password so that the computer turns on when the password is typed. You can also set up the computer to turn on whenever a mouse button is clicked.

These functions are controlled by the *Keyboard* and *Mouse PowerOn* options in the *Peripherals* menu in Setup, see page 73 for more details.

### **Using the Network to Turn On the Computer{xe "Wake on LAN"}{xe "Network card"}{xe "LAN:Remote boot"}**

Your computer supports the Wake On LAN standard that allows a network administrator to start your computer remotely by sending a signal over the network to which your computer is connected. To use Wake on LAN:

- the installed network interface card must support Wake on LAN,
- the card must be connected to the Wake On LAN connector on the motherboard (see page 43 for more details),
- *Resume on LAN Header* in the *Power Management* menu of Setup must be enabled (see page 70 for more details).

If you ordered your computer with an Ethernet card installed, it is set up to support Wake on LAN.

### **Using the Modem to Turn On the Computer**

Your computer supports the Wake On Ring standard that allows it to wake up when an installed modem receives a phone call. To use Wake on Ring:

- the installed modem card must support Wake on Ring,
- the modem card must be connected to the Wake On Ring connector on the motherboard (see page 43 for more details),
- *Resume on Ring Header* in the *Power Management* menu of Setup must be enabled (see page 69 for more details).

## ***Turning Off the Computer***{xe “Turning off the computer”}

There are several ways that you can shut down the computer:

- put the computer into power-saving Suspend mode
- restart the computer
- shut down Windows
- turn off the computer manually.

When the computer returns from Suspend mode, Windows and your application programs should be exactly the same as they were when you entered the mode. This is part of the computer's power management, described in detail on page 23.

## **Restarting the Computer**{xe “Restarting the computer”}{xe “Resetting the computer”}

Restarting the computer reloads the operating system and then you'll have to re-start the applications you want to use again.

To restart Windows, click the *Start* button in Windows, select *Shut Down...*, then select *Restart* and click *OK*. Windows prompts you to save any data that hasn't been saved, closes down open applications, then restarts the computer.

It is very important to always try to restart Windows this way, if you don't, you risk damaging the files in use at the time, and you may not be able to start Windows again. If you do restart the computer without using the Restart feature, the next time you turn it on, you'll see some warning messages and Windows will want to start a program called ScanDisk to make sure there's nothing wrong with the hard disk.

If Windows or a program you are using seems to have stopped responding, press the **Ctrl**, **Alt** and **Delete** keys at the same time. Windows opens the *Close Program* window (it may take a few minutes to appear). The window lists the active programs, and you should be able to close the problem program from here. After that you should be OK, but you should go ahead and close everything else down normally, then restart the computer through the *Shut Down* utility on the *Start* menu.

If closing programs using the *Close Program* window still does not let you restart the computer, you can press **Ctrl-Alt-Del** two times to restart the computer.

## Shutting Down the Computer{x\ “Shutting down”}{x\ “ScanDisk”}

Shutting down Windows closes all applications that are open, and reminds you to save any unsaved files. The next time you turn on the computer, all of the components in and connected to the computer are reinitialized, then Windows starts from scratch and you'll have to start the applications you want to use and load the files you want to work on.

To shut down the computer, click the *Start* button in Windows, select *Shut Down...* and confirm that you want to shut down the computer. Windows prompts you to save any data that hasn't been saved, closes down any open applications, then itself, and finally turns off the computer.

It is very important to always close Windows this way, if you don't, you risk damaging the files in use at the time, and you may not be able to start Windows again. If you do turn the computer off without shutting Windows down in this way, the next time you turn it on, you'll see some warning messages and Windows will want to start a program called ScanDisk to make sure there's nothing wrong with the hard disk.

If Windows or a program you are using seems to have stopped responding, press the **Ctrl**, **Alt** and **Delete** keys at the same time. Window lists the active programs, and you should be able to close the problem program from here. After that you should be OK, but you should go ahead and close everything else down normally, then shut down the computer through the *Shut Down* utility on the *Start* menu.

If pressing **Ctrl-Alt-Del** has no effect, you'll have to turn off the computer manually.

## Turning Off the Computer Manually

If you're using an operating system that doesn't have a Shut Down feature like the one in Windows, you can turn the computer off manually. You can also turn off the computer manually with Windows running, but this is only recommended as a last resort, as you risk damaging files that the operating system needs to run correctly.

To turn the computer off manually, first wait until the hard disk LED on the front of the computer goes out, then use the Power button on the front panel to turn off the computer. The Power button can work in two different ways, depending the *Power Button Mode* setting in the *Power Management* menu of Setup (see page 70 for more details).

If *Power Button Mode* is set to *Instant Off*, as soon as you press the Power button, the computer will turn off. If it set to *Delay 4 sec*, you have to press the button for at least four seconds before the computer will turn off.

## **Power Management{xe “Power management”}{xe “Energy Star”}{xe “ACPI”}{xe “APM”}**

Power management in something as complex as a modern computer is also complex. This section gives an overview of the key features.

### ***ENERGY STAR, ACPI and APM***

First three important industry standards: ENERGY STAR®, ACPI and APM.



Computer equipment is the fastest-growing electric load in the business world. Unfortunately, much of the energy associated with computers is wasted because they are often kept on while not in use. We have followed the US government's Environmental Protection Agency's guidelines to ensure your computer meets the power usage guidelines in their ENERGY STAR® program. ENERGY STAR® computers:

- save you money in electricity bills
- may actually last longer than conventional products because they spend a large portion of time in a low-power Standby mode
- generate less heat than conventional systems
- tend to be quieter than conventional computers.

When you buy any electronic equipment – a printer, monitor, TV or VCR, check that it meets ENERGY STAR® power guidelines.

Your computer complies with the guidelines of the Advanced Configuration and Power Initiative (ACPI), which require that each component in or connected to your computer can be managed by the computer and Windows. This affects both the resources each component needs as well as how it uses power. The power management requirement is that the component stops using power when it isn't being used, but can be ready to work as soon as it's required. For example, the modem should not use power when it's not being used, but as soon as the phone rings, it should pick up the call.

Most of this happens without you doing anything, but it is important that when you use your computer with other devices, such as a modem or a printer, that these devices are also ACPI-compliant; check with the manufacturer or in the user guide.

The Advanced Power Management (APM) specifications are older, less comprehensive requirements for power management; your computer complies with APM 1.2.

The important thing to note about power management is that the components of your computer manage the power they use without needing you to do anything. There is no difference in performance between a computer that supports power management and one that doesn't, but the power-managed computer will be cooler and use less energy.



## ***Controlling Power Management***

Power management in your computer can be controlled by the computer itself or by Windows. If you are using Windows 98, you should let the operating system manage the power, and not use the computer's power management features. The computer's power management is controlled in Setup, see page 70 for more details.

### **Windows Power Management{ XE "Power management:Windows" }{ XE "Windows power management" }**

To access the power management controls within Windows, open *My Computer*, then the *Control Panel*, then open *Power Management*. The Power Management Properties window that is displayed lets you set separate time-outs for System standby, the hard drive and the monitor. If the computer is inactive for the time set here, Windows puts the System into Standby mode, or tells the hard drive or monitor to go into a low-power mode.

You can also put the computer into Standby mode using the *Shut Down...* option on the *Start* menu.

When the computer is in Standby mode, the green Power LED on the front panel flashes.

The computer wakes up from Standby mode when

- you start using the keyboard or the mouse
- an installed modem receives a call; see page 19 for more details
- an installed network card receives a wake-up signal over the network; see page 19 for more details

Note that what Windows calls Standby mode is called Suspend mode in the following sections.

## **The Computer's Power Management{ XE "Suspend mode" }{ XE "Doze mode" }{ XE "Standby mode" }**

Your computer calls its low-power mode Suspend mode, although it is very similar to Windows' Standby mode. The computer enters Suspend mode when it has been inactive for the time set in Setup (see page 70). In Suspend mode, all of the devices in the computer are put into low-power states, and a signal is sent to the monitor to put it into a low-power state.

The computer wakes up from Suspend mode when:

- you press a key on the keyboard or move the mouse
- an installed modem receives a call; see page 19 for more details
- an installed network card receives a Wake on LAN command; see page 19 for more details.

## Using Audio{xe “Audio”}{xe “External speakers”}{xe “Microphone”}

Your computer has three audio jacks on the back panel (see page 12):

- Audio-Out (the lime connector): connects to your external speakers
- Audio-In (the light blue connector): connects to an external source of audio signals, such as a radio
- Microphone-In (the pink connector): connects to a microphone.

You control the volume of audio from your computer in several ways: Windows has its own volume control – double-click on the speaker icon in the lower right corner to display it. You'll see that there is a master volume control as well as individual controls for each input device – the CD drive, microphone, etc. There may also be a volume control in the applications you're using – games usually have their own settings for audio volume. The external speakers also have their own volume control.

For the best signal and the least background noise, you need to maximize the volume in the application and in Windows, then use the external speaker volume control to set the sound level to an acceptable level.

## Using the Diskette Drive{xe “Diskette drive”}{xe “SuperDisk drive”}{xe “1.44MB diskettes”}{xe “120MB diskettes”}

The 3.5” diskette drive in your computer is either a standard diskette drive, supporting 720KB and 1.44MB diskettes or a SuperDisk (LS-120) drive that also supports 120MB diskettes. When you start the operating system from diskette or the hard disk, the diskette drive is drive A; if you start the operating system from the optical drive, the diskette drive becomes drive B.

To start (boot) the computer from a diskette, you first need to check two settings in the *Advanced CMOS Setup* menu in Setup (see page 68 for details); *1<sup>st</sup> Boot Device* should be set to *Floppy* and *Floppy Drive Seek* should be set to *Enabled*. If you do not have a diskette in the drive when the computer is turned on, Windows starts normally from the hard disk.

### **Standard Diskette Drive**

You can insert and remove diskettes at any time, whether the computer is on or off. To insert a diskette, slide it into the drive shutter end first with the label up until it clicks into place and the eject button sticks out. To remove a diskette, first check that the green light on the front of the drive is not lit, then push the eject button.

### **SuperDisk Drive**

The computer must be on when you insert a diskette into the SuperDisk drive; slide it into the drive shutter end first with the label up until it clicks into place.

To remove a diskette, the best way is to use Windows as this ensures that any applications using the diskette are stopped first. Open *My Computer*, right-click on the SuperDisk drive icon, then select *Eject*. If the diskette is being used by a program, it will not be ejected until the program stops using it.

To remove a diskette manually, first check that the green light on the front of the drive is not lit, then push the eject button. If the diskette is being used by a program, it will not be ejected until the program stops using it.

If you need to remove a diskette from the SuperDisk drive but cannot turn on the computer, there is an emergency method. First wait for at least one minute after turning off the computer, then insert a stiff wire like a small, straightened paper clip into the small hole on the front of the drive above the eject button. The diskette should be ejected.

## Using the Keyboard and Mouse{xe “Keyboard”}{xe “Mouse”}{xe “PS/2”}

The keyboard and mouse supplied with your computer use the PS/2 ports on the back of the computer to connect to the system; see page 12 for the location of these ports.

Although the two PS/2 ports look identical, you cannot use them interchangeably. Also, you must not connect the keyboard or mouse when the computer is turned on – if you do you risk damaging both the computer and the keyboard or mouse.

You control how your mouse works using the *Mouse Properties* panel. In the lower right of your screen, next to the clock, you should see a small picture of a mouse. Double-click on this to open the *Mouse Properties* window, then go through each tab to see what features are available. Use the *Help* button at the bottom of the window for more information.

## Using the MIDI/Game Port{xe “MIDI port”}{xe “Game port”}{xe “Joystick”}{xe “USB”}

There are two ways to connect a joystick to your computer:

- via the USB port: USB joysticks can be connected and disconnected without turning off the computer and are automatically configured.
- via the gold MIDI/Game port on the back of the computer; see page 12 for the location of the port. If you use this port, the joystick must be connected before the computer is turned on.

Before you connect a joystick to the game port, first check that the *Onboard Game Port* in the *Peripherals* menu in Setup is not disabled, you also set the port number used here; see page 73 for details. Then follow the instructions that came with the joystick to install it and any software.

The MIDI/Game port can also be used to connect to MIDI devices. Before you connect the MIDI device, check that the *Onboard MIDI Port* in the *Peripherals* menu in Setup is not disabled, you also set the port number and interrupt used here; see page 73 for details. Then follow the instructions that came with the MIDI device to install it and the MIDI software.

## **Using a Modem{xe “Modem”}{xe “Phone line”}{xe “v.90 modem”}{xe “Fax”}{xe “Video:phone”}{xe “DSVD”}{xe “COM ports”}{xe “Serial ports”}**

Your computer may have a modem option card installed; if so you'll see that there are two jacks for telephone lines in one of the slots on the back panel of your computer. One of the jacks (LINE) connects to the telephone line, the other (PHONE) can be connected to a telephone so that you can use the line to make calls when the computer is not using it. The modem supports the following:

- data reception using the v.90 standard – you can down-load data at up to 56kbps when connected to an Internet Service Provider (ISP) with compatible equipment. Current US FCC regulations limit data transfer rates to 53kbps due to excessive power demands at higher speeds.
- data modem connections up to 33.6kbps with error correction (v.42/ MNP 2-4) and data compression (v.42bis/ MNP5)
- video phone connections using the v.80 standard
- digital simultaneous voice and data (DSVD) connections over a single telephone line using the v.70 standard
- up to 14.4kbps fax transmission and reception.

With the modem installed, there are two serial devices in your computer: the serial port on the back panel and the modem. Windows refers to the built-in port as COM1 and to the modem as COM2. You can change this by using Setup to change the address and interrupt used by the built-in port (see page 73 for more details).

To use your modem with your communications program, you just need to tell the program that the modem is on COM2. Some older applications ask for a modem file; in this case, you should get a newer version of the application that uses the Windows settings.

## **Using a Network Card{xe “Network card”}{xe “LAN”}{xe “Ethernet card”}{xe “SMC Ethernet card”}{xe “Intel Pro/100+”}{xe “DMI”}{xe “LANDesk”}**

If you ordered a network card with your computer, you'll see a single Ethernet 10BaseT connector in one of the option slots on the back panel; connect the cable from your network here. The network card is an SMC 10/100BaseT network adapter.

With the network card installed, your computer supports several key network management features:

- Desktop management interface (DMI) 2.0 and SMBIOS 2.1 support that allows inventory management over the network or via a modem
- Intel's LANDesk Client Manager (LDCM) which simplifies many of the tasks required for maintaining a PC, for example, reviewing system and configuration information about DMI/SMBIOS-compliant hardware components, backing up and restoring system files, troubleshooting system errors.
- Wake on LAN support that allows your network administrator to remotely start your computer for maintenance.

## **Using the Optical Drive{xe “Optical drive”}{xe “CD-ROM drive”}{xe “DVD drive”}{xe “CDR-W drive”}{xe “Music CDs”}{xe “MPEG-2”}**

Your computer contains one of three optical drives:

- a CD-ROM drive that you can use to access most compact disks
- a DVD-ROM drive that you can use to access most compact disks and DVD disks
- a CD-RW drive that you can use to access most kinds of compact disks, and record data on special kinds of compact disks.

A CD-ROM (Compact Disk, Read Only Memory) disk can store up to 74 minutes of music or 650MB of computer data and is read-only – you cannot change the data on the disk.

DVD-ROM disks can hold up to 18GB of data and are also read-only. Most DVD disks contain movies or instructional videos; the video and audio data on DVD disks is compressed using the MPEG-2 standard.



There are two standards for recording (writing) data to CDs: CD-R and CD-RW. CD-R is a write-once technology – once the data is written to the disk, it cannot be changed or erased; this makes CD-R an excellent choice for making permanent records of data. Data can be written, erased and rewritten to CD-RW disks. The CD-RW drive in your computer supports both CD-R and CD-RW technologies.

CD-RW cannot be read by all standard CD-ROM drives and CD players. The recording material of a CD-RW disk isn't as reflective as a regular CD-ROM or a CD-R disk, so recorded CD-RW disks are only readable in CD-ROM drives with CD-RW or multi-read compatibility. While most new CD-ROM drives are compatible with CD-RW disks, many existing drives cannot read CD-RW disks. So, if you are making an audio CD, you should use CD-R disks that will play in your car or home stereo system, not CD-RW disks that probably won't. The CD-ROM, DVD-ROM and CD-RW drives available for your computer can all read CD-RW disks.

There are two standards of writing to CD-R and CD-RW disks: pre-mastering and Drive Letter Access (DLA). Pre-mastering software assembles all of the data, then writes all at one time (or session) to the disk. A multi-session disk has several of these sessions recorded on it.

DLA (or packet writing) software formats the disk much like a diskette or hard disk, so that files and folders can be dragged from any source to the drive letter of the disk. Files can even be saved directly from an application to this kind of disk, since it behaves just like a diskette or hard disk.

When your computer was set up in the factory, the optical drive is drive D.

To start (boot) the computer from a bootable CD in the optical drive, you first need to check the settings in the *Advanced CMOS* menu in Setup; the *1<sup>st</sup> Boot Device* should be set to *CDROM* (see page 68 for details). If you do not have a bootable disk in the drive when the computer is turned on, Windows starts normally from the hard disk.

When you boot from a CD, it becomes drive A, and the diskette drive B.

To insert a CD or DVD disk, the computer needs to be turned on. Press the load/eject button on the front of the drive and the tray should open. Place the disk in the center of the tray, then press the load/eject button again to close the drive. You will hear the drive start, but wait about 10 seconds before trying to access the disk.

If you insert an audio CD, Windows will automatically detect it and start to play it. If you insert a data CD, depending on how the disk was created, Windows may automatically start the Setup program on the disk; if it doesn't, check with the application user guide for information on installing and using the disk.

To remove a disk, the best way is to use Windows as this ensures that any applications using the disk are stopped first. In the *Control Panel*, right-click on the drive icon, then select *Eject*.

If the disk is being used by a program, the drawer will not open until the program stops using it.

To remove the disk manually first check that the light on the front of the drive is off, then press the load/eject button on the front of the drive. The disk stops spinning, then the drawer opens. If the disk is being used by a program, the drawer will not open until the program stops using it.

## **Using the Parallel Port{xe “Printer”}{xe “Scanner”}{xe “ECP”}{xe “EPP”}{xe “Bi-directional”}**

The most common use of the parallel port is to connect a printer or a scanner.

The parallel port is the burgundy port on the back of your computer. Before connecting or disconnecting a parallel port device, make sure the computer is turned off. If you try to connect the device with the computer, you risk damaging both the computer and the device.

There are four modes in which the parallel port can work: standard, bi-directional, extended capabilities port (ECP) and enhanced parallel port (EPP). Older printers use standard (unidirectional) mode, but newer ones support bi-directional and ECP modes. Parallel port scanners can work in bi-directional mode, but are faster in ECP and EPP modes. Most storage devices require bi-directional mode, but can also work in ECP or EPP modes for better performance. You set which mode the built-in parallel port uses through Setup; see page 73 for more details.

Unfortunately, there are several different implementations of the EPP “standard” so if you cannot get a parallel device to work in EPP mode, check with the manufacturer to make sure you have the latest drivers.

The default setting of the parallel port is uni-directional (normal). Some parallel devices have a pass-through connector, so that you can connect several parallel port devices in a “daisy chain”. If you are planning to do this, connect each device by itself, and make sure it is working correctly before linking them together.

## Security{xe “Security”}{xe “Padlock”}{xe “Password”}

There are several ways in which you secure your computer and the data on it:

- use the padlock loop on the back of your computer (see page 12) to prevent the system cover from being removed, and so restrict access to the drives and motherboard
- use Supervisor and User passwords to restrict access to Setup and the operating system
- use a Windows password.

### *User and Supervisor Passwords{xe “Password”}{xe “User password”}{xe “Unattended start”}*

You can use Setup to set two passwords – User and Supervisor – that restrict access to Setup and the operating system. When you set a Supervisor password, this must be entered to enter Setup. You can also require this to be entered before the operating system is started. When a Supervisor password is set up, you can also set up a User password that you can require before the operating system is started. However, the User password cannot be used to enter Setup.

The password can be up to six characters long. It is case-sensitive, so make sure you note the **Caps Lock** setting before setting a password.

To set a password:

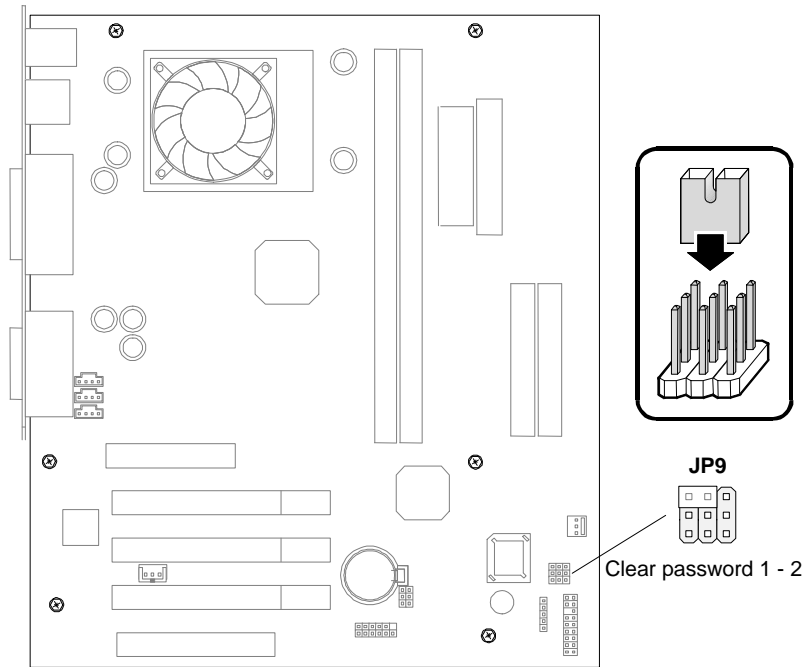
1. Turn on the computer and press **Delete** to run Setup.
2. Highlight *Change Supervisor Password* and press **Enter**.
3. Type the new password and press **Enter**.
4. Type the new password again and press **Enter**.
5. On the *Advanced CMOS Setup* Menu, set *Password Check* to *Always* (requires the password to entered before starting Setup or the operating system) or *Setup* (restricts access to Setup only).

After setting a Supervisor password, you can use the same procedure to set a User password using *Change User Password*.

To change the password, follow the same steps. To delete a password, follow the same steps, but do not type anything.

If you set a password, but then forget it, you can clear the password using a jumper on the motherboard.

1. Follow the instructions on page 41 to remove the system cover.
2. Place a jumper over pins 1 and 2 of the Password/CMOS Clear Jumper (JP9).



3. Replace the system cover, reconnect the power cord, then turn on the computer. The password is now cleared
4. Turn off the computer and disconnect the power cord. Remove the system cover.
5. Remove the jumper from pins 1 and 2 of the Password/CMOS Clear Jumper.
6. Follow the instructions on page 42 to replace the system cover.

## ***Windows Password***{xe “*Windows password*”}

As well as the passwords to restrict access to Setup and to the overall system, you can also set a password to access Windows. Note that this does not prevent access to the computer – anyone can skip the password and still access the data on the hard disk.

However the Windows password does allow you to set up Windows in different ways for different users. And once the password is entered, Windows can then remember any passwords for other programs you then set.

To set a Windows password, use the *Password* utility in the *Control Panel*. To stop Windows prompting you for a password, use the *Password* utility to change to a new password, but do not type a new one.

## **Using the Serial Port**{xe “*Serial ports*”}{xe “*COM ports*”}{xe “*Mouse*”}{xe “*External modem*”}

You can connect most serial devices such as mice and external modems to the serial port on the back panel. Serial devices must be connected and disconnected when the computer is turned off in order to work correctly. If you connect the device with the computer turned on, you may damage both the computer and the device.

Once the device is connected and turned on, you’ll probably need to run a Setup program, refer to the device’s manual for details.

However, the serial port standard is an old, slow one, so when you have a choice, use USB devices instead of serial ones – USB devices are faster, can be connected without turning off the computer and support plug and play so you don’t have to reload drivers each time you connect or disconnect a device.

Windows refers to serial devices as COM1, COM2, COM3, etc, and assigns these according to the addresses and interrupts of the serial devices. The address and interrupt of the built-in serial port are set in Setup (see page 73), the default setting for the built-in serial port is as COM1.

## Using the USB Ports{x e “USB”}{x e “Universal Serial Bus” \t “See USB”}{x e “Hubs”}

The Universal Serial Bus (USB) ports give you an easy way to connect accessories. Previously, you had to connect external devices in several different ways – parallel, serial, PS/2, game port – the computer and external device had to be turned off while doing this, and you spent a long time getting everything to work together. With USB, you can connect up to 127 devices to your computer, using cables between each device up to 16 feet (5m) long, each using the same type of connector and you can connect USB devices with the computer on or off. The first time you connect a device, you may have to load some software, but after that, the device is configured automatically.

## Using the Video Controller{x e “Video:controller”}{x e “VGA card”}{x e “ATi video card”}

Your computer uses a built-in graphics controller with integrated full 2D hardware acceleration, 3D hyper-pipelined architecture and full MPEG-2 motion compensation. The graphics accelerator uses system memory for texture, display and Z- buffers.

To adjust the display properties, open the *Control Panel* in *My Computer* then open the *Display* icon. You can use the *Settings* tab to adjust the colors and resolution; click on the *Advanced* button to make adjustments to brightness and contrast.

## Using the Zip Drive{xe “Zip drive”}{xe “100MB cartridges”}

If you bought your computer with a Zip drive installed, it will be below the diskette drive in the front panel. A Zip drive allows you to store up to 100MB of data and programs on special Zip 100 cartridges, and then share the information with the millions of other computers with Zip drives installed.

The computer needs to be turned on to insert a Zip 100 cartridge. Insert the cartridge shutter end first with the label up until it clicks into place. After inserting the cartridge the light on the front of the drive flashes as the cartridge is initialized. After the initialization, you can access the cartridge.

The cartridge eject button on the front of the Zip drive houses a light and the emergency manual eject mechanism.

Light	Activity
ON Steady	Power on diagnostics
OFF	No cartridge inserted Cartridge inserted but not spinning Cartridge inserted and spinning, but media not being accessed
Fast Blink	Drive spinning up or down
Irregular Blink	Media being accessed Format in progress
Slow Blink	Drive or cartridge malfunction

The best way to eject a cartridge is to use Windows, as this ensures that the cartridge is not being used before removing it. In *My Computer*, right-click on the *Zip 100* icon, then select *Eject*.

You can also use the eject button; first check that the light on the front of the drive is not on, then press the button. The cartridge spins down, then it is ejected. If the cartridge is being used, it will not be ejected.

When you shut down Windows, the cartridge is automatically ejected.

If you need to remove a cartridge but cannot turn on the computer, there is an emergency method. First wait for at least one minute after turning off the computer, then insert the a thin stiff wire, like a small, straightened paper clip, into the small hole on the front of the drive. The cartridge should be ejected.

## Changing Your Computer

This section covers some of the ways you can change your computer, including:

- adding more memory
- removing and replacing your drives
- removing and replacing an option card
- changing the processor
- replacing the RTC battery.

As well as the steps in this section, make sure you read all of the instructions that came with the component you're going to install.

### ***Before You Begin***

Before you install any options or option cards, read and follow the following cautions.

- Before attempting to remove the cover, unplug the power cord from the wall socket and disconnect all cables attached to the computer from the keyboard, mouse, monitor, printer and so on.
- Even when the front panel power switch is off, hazardous voltage and current levels are present inside the computer. Do not operate the computer with the cover removed – always replace the cover before turning on the system.
- Electrostatic discharge (ESD) can damage disk drives, option cards, or other system components. You should use an anti-static wrist strap attached to a ground when working inside the system. Place system components or option cards on a conductive foam pad to reduce the risk of electrostatic buildup.
- Disconnect the computer from any telecommunications links, networks, or modems before performing any of the procedures described in this chapter. Failure to disconnect power, telecommunications links, networks, or modems can result in personal injury or equipment damage. Some circuitry on the motherboard can continue to operate even though the front panel power button is off.

**WARNING:** Failure to disconnect power before removing the cover can result in personal injury and/or equipment damage!

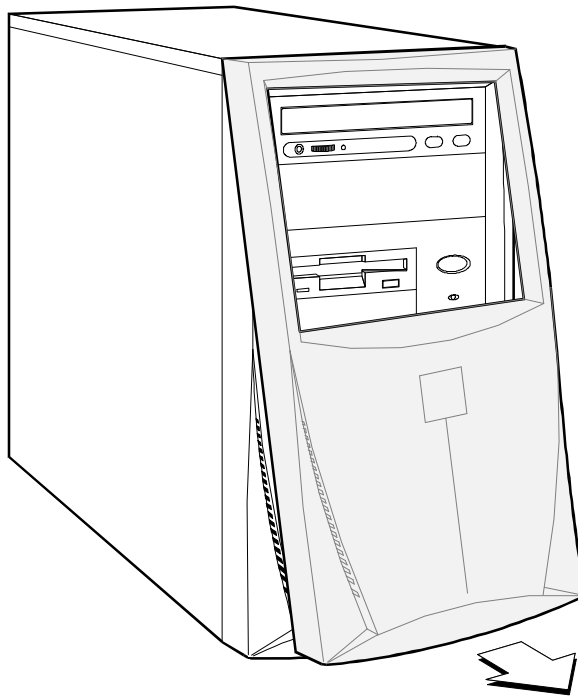


## ***Getting Inside the Computer{xe “Front panel”}{xe “Drive bays”}***

If you are going to install devices into the 3.5” or 5.25” drive bays, you need to first remove the front bezel; otherwise you only need to remove the system cover.

### **Removing the Front Bezel**

Grasp the plastic lip at the bottom of the front bezel, then pull out and then up until the front bezel is free.



### **Replacing the Front Bezel**

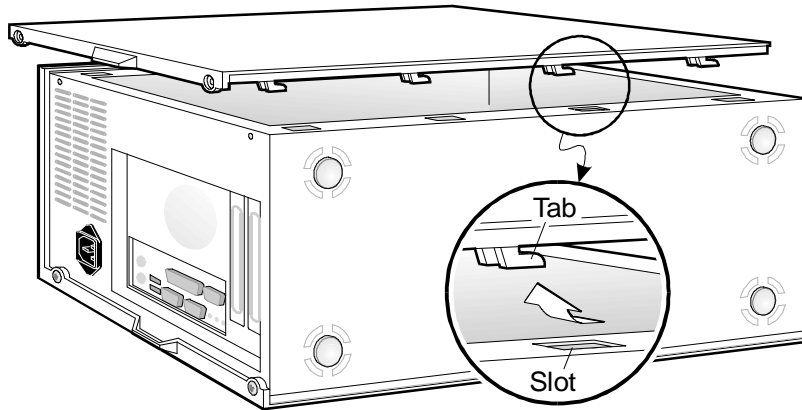
Align the plastic tabs at the top of the bezel with the slots on the unit then press along the face of the front bezel until the tabs snap into place.

## Removing the System Cover{ XE “System cover” }

The system cover is on the left side of the computer when viewing it from the front. There is also a cover on the right side of the unit, but it is not necessary to remove this.

Make sure you read the warnings on page 40.

1. Lay the unit on its right side and remove the padlock if one is being used to secure the cover.
2. Remove two retaining screws from the rear of the system cover.
3. Slide the cover toward the rear of the chassis until the front edge is free from the front panel.



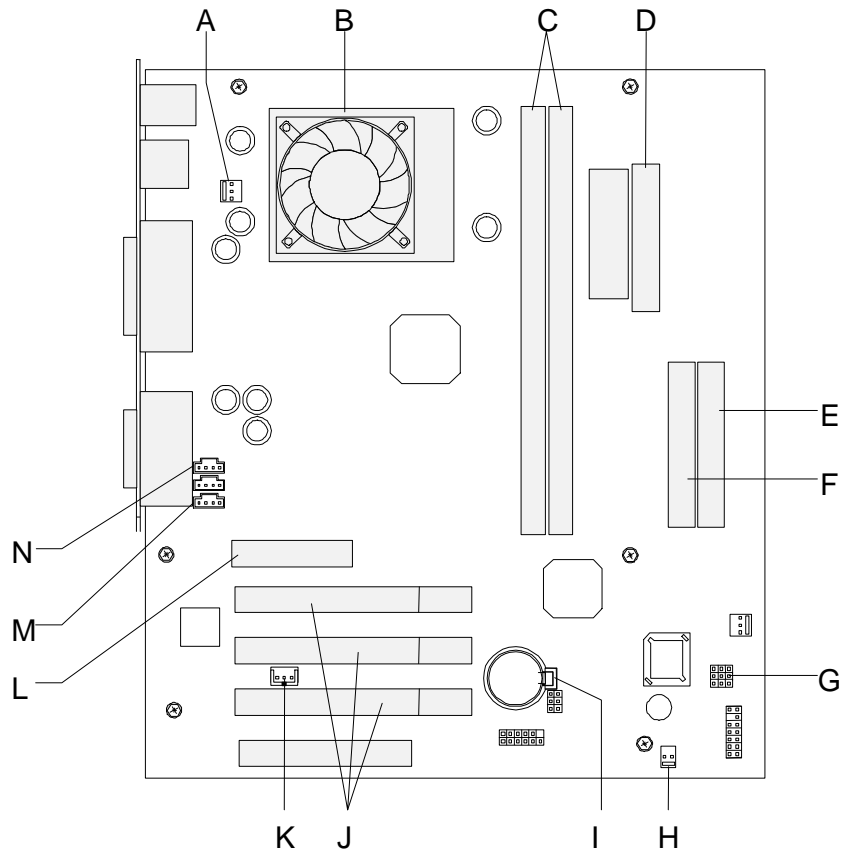
4. Lift the cover straight up to remove it from the chassis.

## Replacing the System Cover

1. Lay the unit on its right side and make sure that all internal cables and cards are properly installed and that screws are tightened.
2. Place the cover down over the chassis so that the tabs on the cover fit into the slots on the chassis.
3. Slide the cover forward until the front edge is under the front panel and the back edge is against the rear of the chassis.
4. Reinstall and tighten the retaining screws at the rear of the cover.
5. If you're using one, replace the padlock.

## Motherboard Layout

{xe “Motherboard”}{xe “Processor:socket”}{xe “Processor:fan”}{xe “Jumpers”}{xe “Password jumper”}{xe “BIOS:configuration jumper”}{xe “Fan connectors”}{xe “RTC battery”}{xe “Memory”}{xe “DIMMs”}{xe “IDE”}{xe “PCI cards”}{xe “AGP”}{xe “ISA cards”}{xe “CD-ROM drive”}{xe “Wake on LAN”}{xe “Wake on ring”}



A	Processor fan	F	Secondary IDE	K	Wake On LAN
B	Processor	G	Password/CMOS clear jumper	L	AMR card slot
C	DIMM sockets	H	Wake On Ring	M	CD-ROM audio
D	Diskette drive	I	Real-time clock battery	N	Telephony

E	Primary IDE	J	PCI card slots
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## ***Adding Memory{xe “Memory”}{xe “Adding memory”}{xe “DIMMs”}{xe “SDRAM”}***

The memory in your computer is installed in two DIMM (dual in-line memory module) sockets, labeled DIMM 1 and 2. When installing memory modules, insert the modules in socket 1, then 2.

Depending on how the memory was installed in your computer when you bought it, you may have an empty socket for you to add more memory, or you may have to remove a module in order to increase the memory.

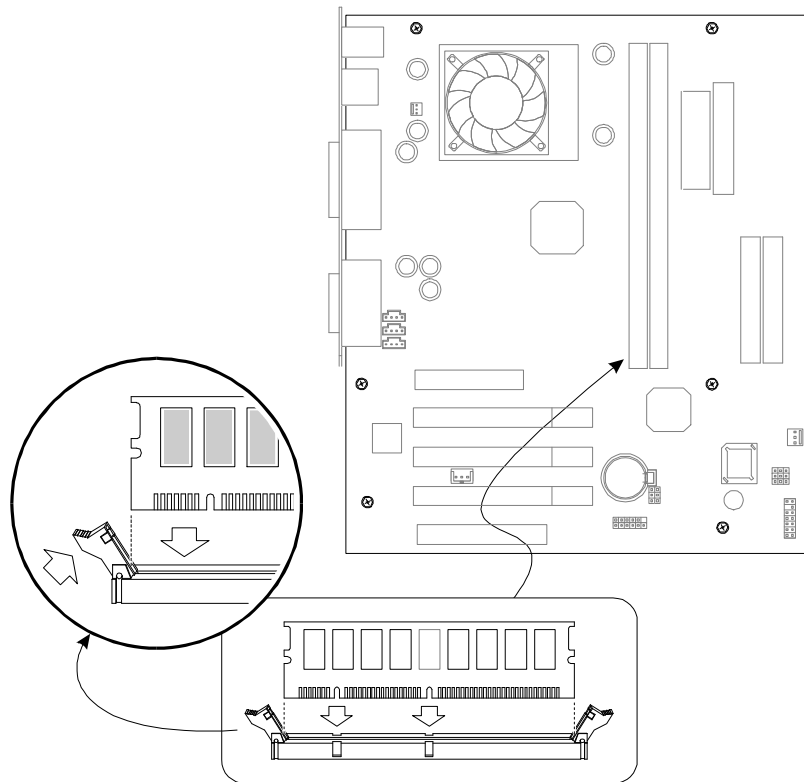
Each socket accepts 66MHz (or faster) unbuffered SDRAM modules with 32, 64, 128 or 256MB of memory. The DIMM modules must be gold-plated, with 168 pins and use 3.3V.

### **Removing a Memory Module**

1. Follow the instructions on page 41 to remove the system cover.
2. If you unplug some of the cables that are attached to the motherboard and drives in order to get to the DIMM sockets, label the cables so that you will be able to reinstall them later.
3. Gently spread the retaining clip at each end of the DIMM, then, holding the DIMM only by the edges, lift it away from the socket.
4. Store the DIMM in an anti-static package.
5. Reconnect any cables you had to unplug.
6. Follow the instructions on page 42 to replace the system cover.

## Installing a Memory Module

1. Follow the instructions on page 41 to remove the system cover.
2. If you unplug some of the cables that are attached to the motherboard and drives in order to get to the DIMM sockets, label the cables so that you will be able to reinstall them later.
3. Holding the new DIMM only by the edges, remove it from its anti-static package.
4. Align the notches in the bottom edge of the DIMM with the notches in the DIMM socket, then insert the bottom edge of the DIMM into the socket, making sure that it is seated firmly. The retaining clips should snap into place.



5. Reconnect any cables you had to unplug.
6. Follow the instructions on page 42 to replace the system cover.

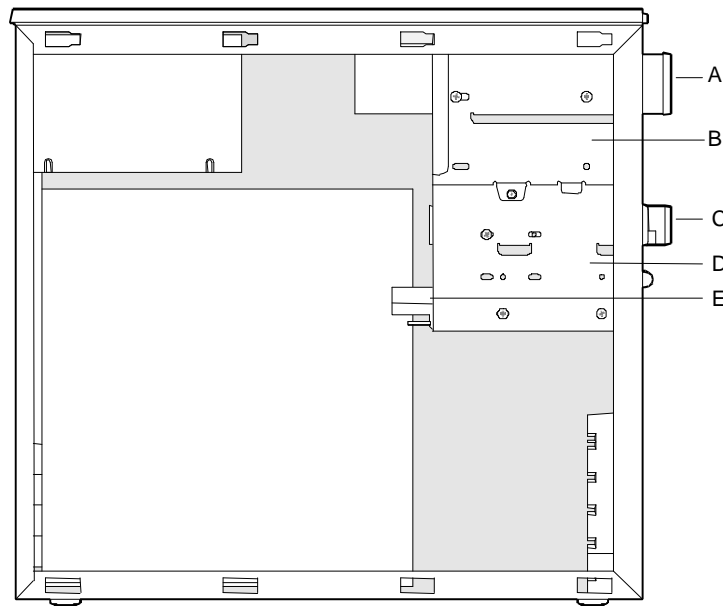
## **Changing Drives{xe “Drive bays”}{xe “5.25\” drives”}{xe “3.5\” drives”}{xe “Diskette drive”}{xe “Optical drive”}**

There are two sets of drive bays in your computer: a set of two 5.25” drive bays and a set of three 3.5” drive bays.

Both of the 5.25” drive bays can be accessed from outside of the computer via openings in the front bezel. The upper bay (labeled A in the following diagram) contains the optical drive; the lower bay (B) is available for you to install your own drive.

The upper two 3.5” drive bays can be accessed from outside of the computer via openings in the front bezel. The upper bay (labeled C) contains the diskette or SuperDisk drive; the middle bay (D) will contain a Zip drive if you ordered one; the lower bay (E) is not accessible from outside the computer and contains the hard disk.

You can change the installed drives or add additional drives in the empty bays. You can put an additional 3.5” drive in the empty 3.5” bay, or you can install it in one of the 5.25” bays if you mount the drive in a 5.25” drive carrier.



If you have a standard 1.44MB diskette drive in your computer, it connects to the motherboard via a special FDD cable. The other drives in your computer (the hard drive, the optical drive, the SuperDisk or Zip drives) connect via IDE data cables.

The motherboard in your computer has two IDE connectors, called primary and secondary; each connector has an IDE data cable connected to it. Each IDE cable can have two drives on it. For faster data transfer rates, it is better if you connect hard drives to the primary IDE cable, and the optical drive to the secondary one. Additional IDE drives can be connected to either of the remaining IDE connectors.

If you do connect two IDE drives to the same cable, you need to make sure that one drive is configured as an IDE master and other as an IDE slave. In general, the hard disk that contains the operating system should be the master. Slave and master are usually set by jumpers on the drive, refer to the information that came with the drive for details.

The power supply in your computer has four power cables for drives: three larger connectors for IDE drives and a smaller connector for a standard diskette drive.

### ***Changing Drives in the 3.5" Drive Bays{ XE "Diskette drive" }***

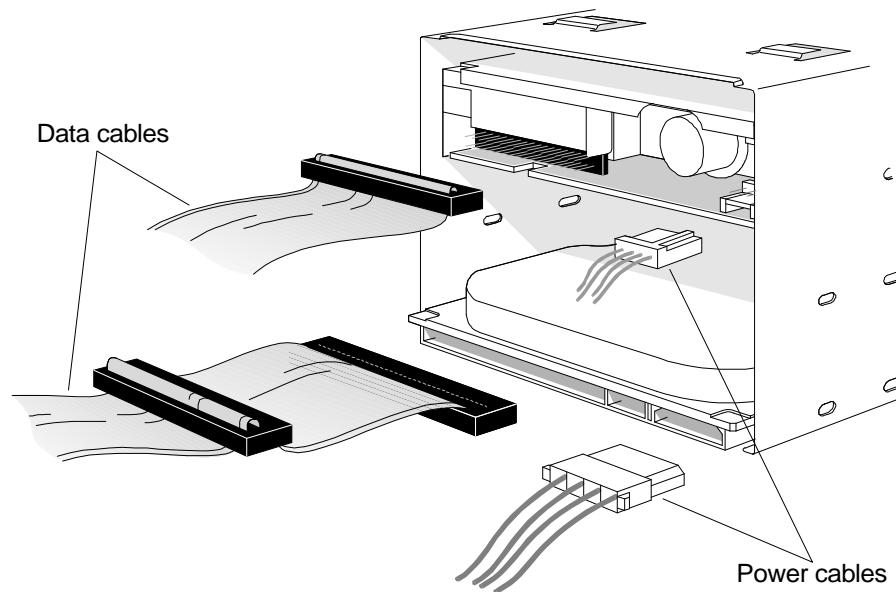
The following instructions tell you how to remove and install a diskette drive in the upper 3.5" drive bay, but you can also use them for drives in the other two bays.

**CAUTION:** While performing the following procedure, be careful not to scrape the drive cables or the mounting bracket against the motherboard and any cards that are attached to it.



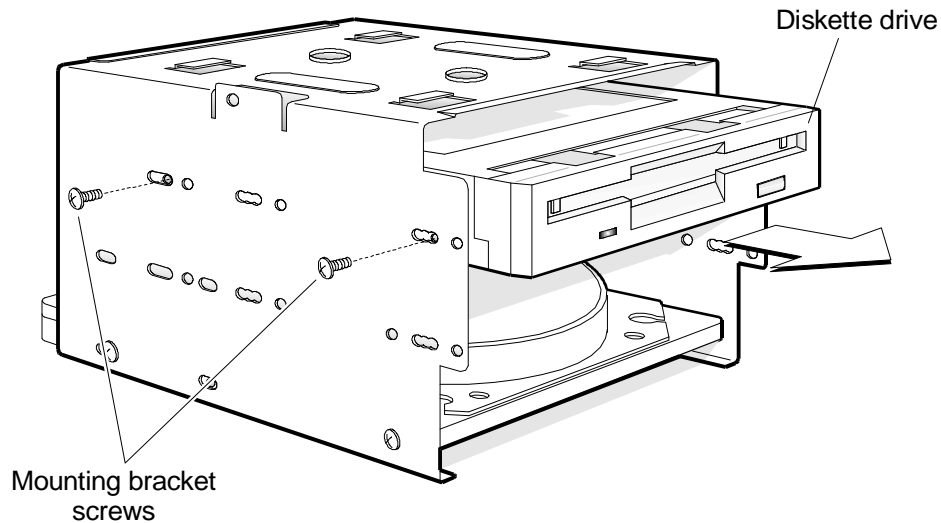
## Removing a 3.5" Drive

1. Follow the instructions on page 41 to remove the system cover.
2. Disconnect the power and the ribbon data cables from the drives in the 3.5" drive mounting bracket. If necessary, label the cables to assist you in reinstalling them later.



3. The 3.5" drive mounting bracket is secured inside the computer with a screw that goes into the 5.25" mounting bracket. Remove and save the screw.
4. Slide the 3.5" drive mounting bracket toward the back of the unit until it disengages from the 5.25" drive mounting bracket. Lift the mounting bracket out of the unit and lay it on one side on an anti-static surface.

5. Remove and save the two screws on each side of the bracket (total of four screws). Pull the drive out the mounting bracket.



6. Store the drive in an anti-static protective wrapper.

### **Installing a 3.5" Drive**

1. Use the instructions in the previous section to remove the 3.5" drive mounting bracket from the computer.
2. Remove the drive from its protective wrapper and place it on an anti-static surface.
3. Set any drive jumpers or switches according to the manufacturer's instructions.
4. With the connectors on the drive to the rear, slide the drive into the front of the 3.5" mounting bracket. If you are installing a hard drive, this slides in from the back of the bracket. Line up the holes on the bracket with the screw holes on the drive.
5. Insert and tighten two screws on each side of the drive.
6. If you are installing the drive into a bay that was empty, remove the EMI filler panel on the front panel of the cabinet and the plastic bezel insert on the front bezel.
7. Align the top of the 3.5" drive mounting bracket with the bottom of the 5.25" drive mounting bracket.

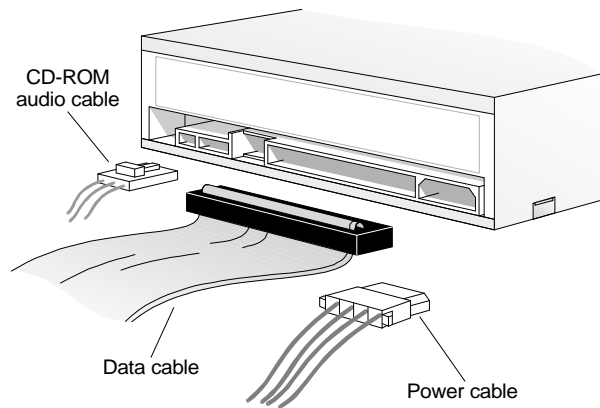
8. Slide the 3.5" drive mounting bracket toward the front of the unit. The screw hole at the top of this bracket should line up with the screw hole on the 5.25" drive mounting bracket.
9. Insert and tighten the screw that attaches the 3.5" drive mounting bracket to the 5.25" drive mounting bracket.
10. Attach the power and data cables to the drives in the 3.5" drive mounting bracket.
11. Follow the instructions on page 42 to replace the system cover.

### ***Changing Drives in the 5.25" Drive Bays***

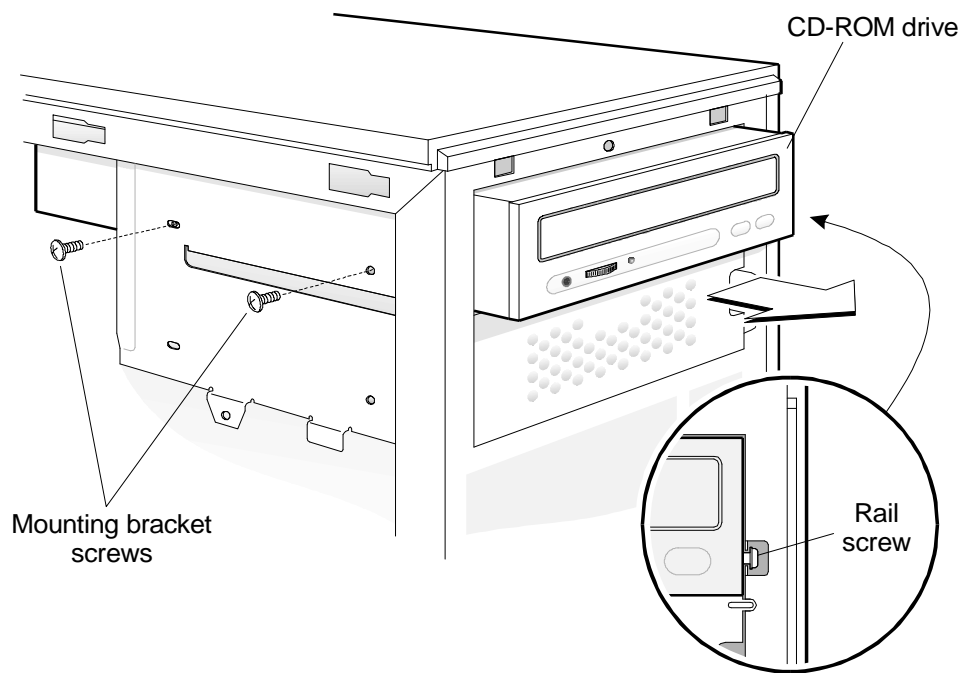
**CAUTION:** While performing the following procedure, be careful not to scrape the drive cables or the mounting bracket against the motherboard and any cards that are attached to it.

#### **Removing a 5.25" Drive**

1. Follow the instructions on page 41 to remove the front bezel.
2. Follow the instructions on page 42 to remove the system cover.
3. Disconnect the cables from the drive. If necessary, label the cables to assist you in reinstalling them later.



4. Remove and save the two screws that secure the drive to the 5.25" drive mounting bracket.

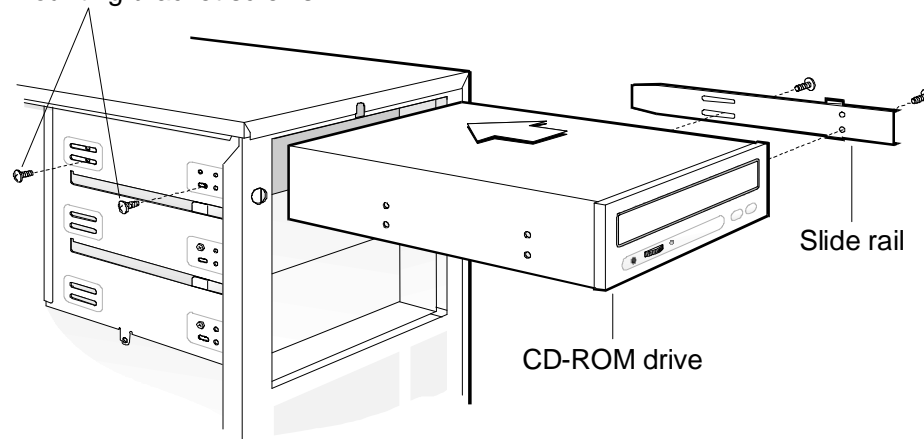


5. Slide the drive out through the front of the computer.
6. Remove and save the slide rail from the right side of the drive.
7. If the device is a 3.5" device mounted in a 5.25" carrier, remove the screws that hold the drive in place in the carrier. Slide the drive from the carrier.
8. Place the drive in an anti-static wrapper.
9. Follow the instructions on page 42 to replace the system cover.
10. Follow the instructions on page 41 to replace the front bezel.

## Installing a 5.25" Drive

1. Follow the instructions on page 41 to remove the front bezel.
2. Follow the instructions on page 42 to remove the system cover.
3. Remove the drive from its protective wrapper and place it on an anti-static surface.
4. Set any drive jumpers or switches according to the manufacturer's instructions.
5. If you are installing a 3.5" drive, mount it in a 5.25" drive carrier.
6. Attach a slide rail on the right side of the device (or drive carrier). If you are replacing a drive, use the slide rail from the drive you removed. If you are installing a drive in a bay that was empty, use one of the slide rails included with your computer.
7. If you are installing the drive into a bay that was empty, you may need to remove the EMI filler on the front panel of the cabinet and the plastic bezel insert on the front bezel.
8. Align the slide rail with the slots in the side of the bay, then slide the drive into place. The holes on the left side of the drive should line up with the screw holes on the mounting bracket.

Mounting bracket screws



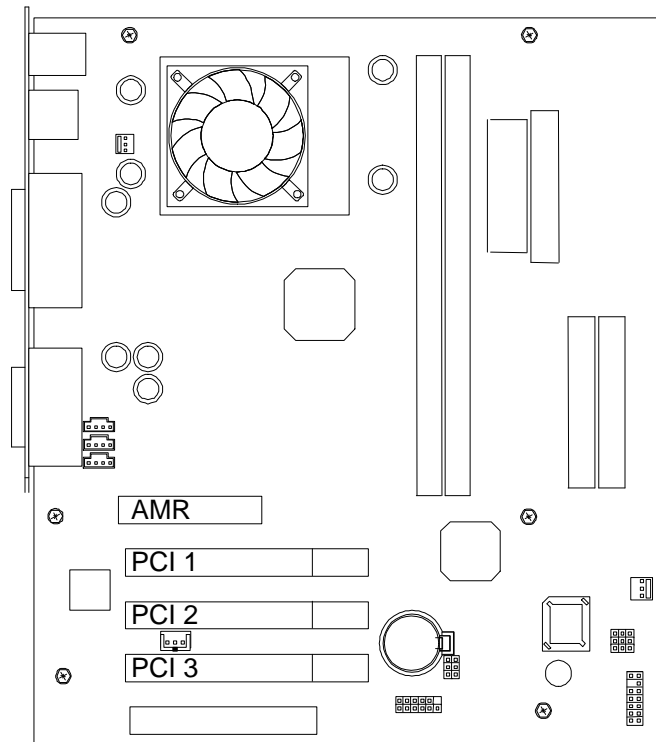
9. Insert and tighten two screws on the left side of the mounting bracket to secure the drive.
10. Attach the cables to the drives in the carrier.

11. Follow the instructions on page 42 to replace the system cover.
12. Follow the instructions on page 41 to replace the front bezel.

### ***Changing Option Cards{xe “Option cards”}{xe “AGP”}{xe “PCI cards”}{xe “ISA cards”}***

The motherboard in your computer has connectors for two types of option cards:

- one Audio/Modem Riser (AMR) card connector (labeled AMR below)
- three PCI card connectors (PCI1 through 3).



If you ordered a modem with your computer, it may be installed in the AMR connector or in one of the PCI slots. If you ordered your computer with a network card, it will be installed in one of the PCI slots.

The system is designed to provide an average of 3A (amps) of +5 V power for each card in the system. The total +5 V current-draw in a fully loaded system (all option card slots filled) must not exceed 9A.

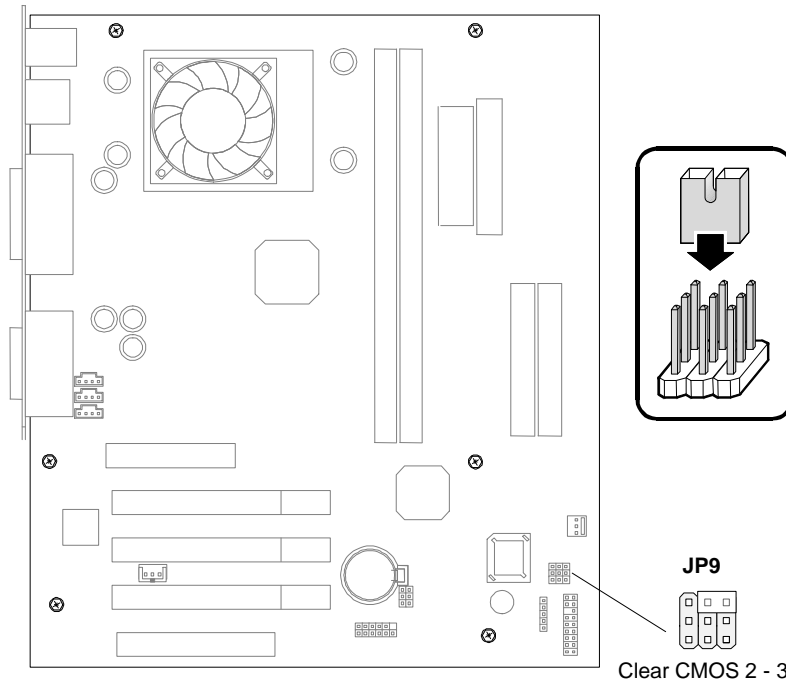
When a card is installed, you can access the external connectors on it via an opening in the back of the computer. When no card is installed in a slot, the opening is closed by a cover. If you remove or move a card, it is important that you use the covers to close the opening to ensure correct electromagnetic shielding and to ensure proper cooling.

Option cards can be extremely sensitive to ESD (Electrostatic Discharge) and always require careful handling. Hold the card by the edges only, and do not touch the electronic components or gold edge connectors. After removing a card from its protective wrapper or from the system, place it flat on a grounded, static-free surface, component-side up. Do not slide the card across any surface.

Your computer has a PCI configuration utility that automatically sets up a newly-installed PCI card to work with your computer and other PCI cards. However, if you install a new PCI card, it could conflict with the existing configuration so much that you cannot start the computer. If this happens, reset the configuration data as described on the next page.

## Resetting PCI Configuration Data

1. Follow the instructions on page 41 to remove the system cover.
2. Place a jumper over pins 2 and 3 of the Password/CMOS Clear Jumper (JP9).

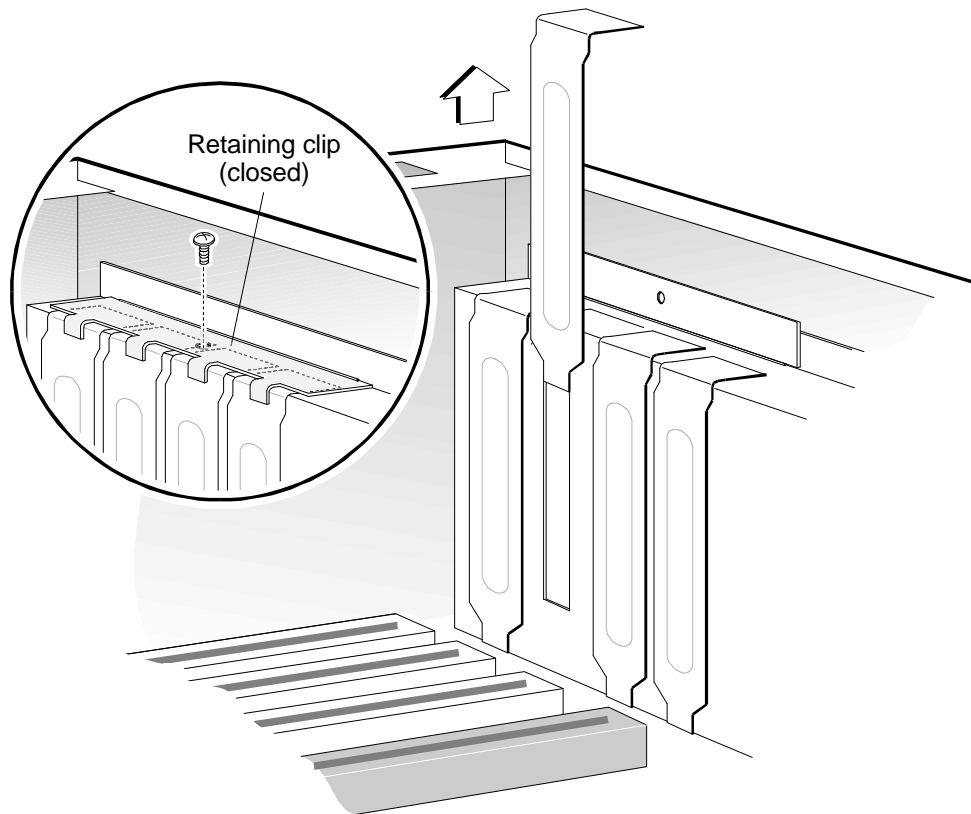


3. Replace the system cover, reconnect the power cord, then turn on the computer. The CMOS and PCI configuration data is now cleared.
4. Turn off the computer and disconnect the power cord. Remove the system cover.
5. Remove the jumper from pins 2 and 3 of the Password/CMOS Clear Jumper.
6. Follow the instructions on page 42 to replace the system cover.
7. Now install the PCI cards one at a time, making sure everything is working after each card is installed.



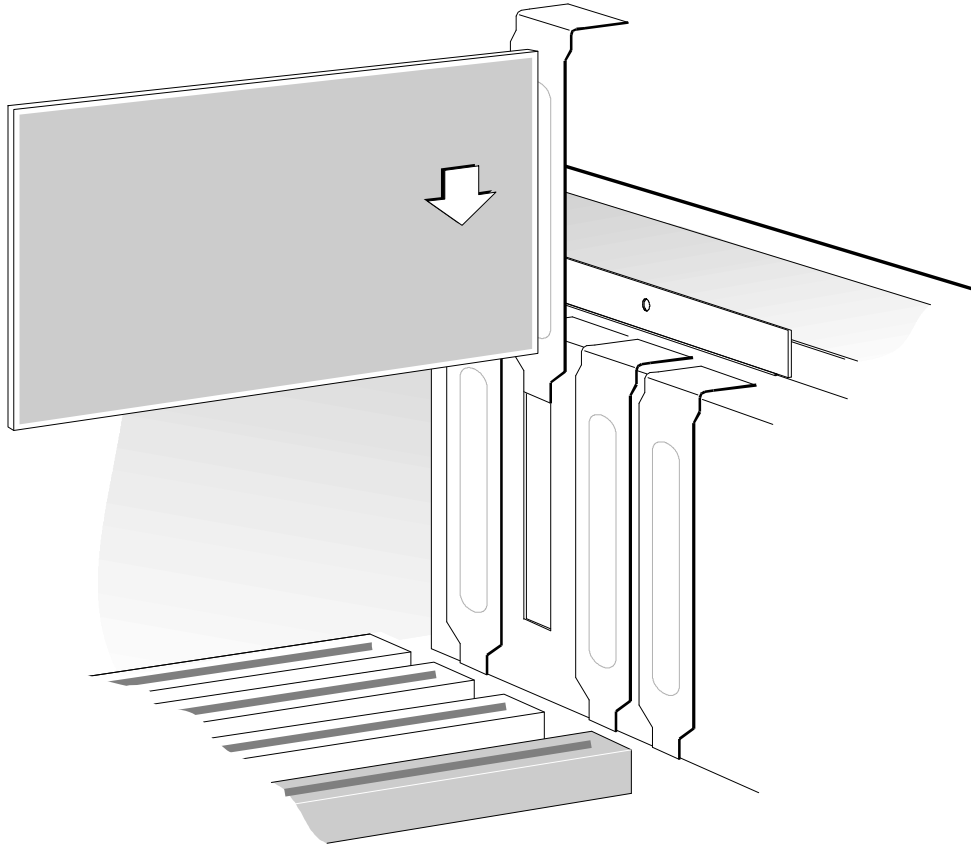
### Installing an Option Card

1. Follow the instructions on page 41 to remove the system cover.
2. Remove the screw from the middle of the slot cover retaining clip.
3. Rotate the slot cover retaining clip until it is clear of the expansion slots.
4. Slide the slot cover away from the card rack and lift it out. Save the slot cover in case you need to remove the card.



5. Remove the option card from its wrapper and place it on a grounded, static-free surface, component-side up.
6. Set any card jumpers or switches according to the manufacturer's instructions.

7. Holding the card by its top edge or upper corners, firmly press it into the connector on the motherboard.



8. Ensure that the card's connectors line up through the open slot at the back of the cabinet.
9. Rotate the slot cover retaining clip back to its normal position.
10. Secure the retaining clip by reinstalling the retaining clip screw.
11. Connect cables (if needed) to the installed card.
12. Follow the instructions on page 42 to replace the system cover.

### **Removing an Option Card**

1. Follow the instructions on page 41 to remove the system cover.
2. Disconnect any cables attached to the option card to be removed.
3. Remove the screw from the middle of the slot cover retaining clip.
4. Rotate the slot cover retaining clip until it is clear of the expansion slots.
5. Hold the card at each end and gently rock it back and forth until the edge connectors pull free. Be careful not to scrape the card against other components.
6. Store the card in an anti-static protective wrapper.
7. Install an expansion slot cover over the vacant opening in the back panel.
8. Rotate the slot retaining clip back to its original position and reinstall the retaining clip screw.
9. Follow the instructions on page 42 to replace the system cover.

## ***Changing the Processor{xe “Processor”}{xe “CPU”}***

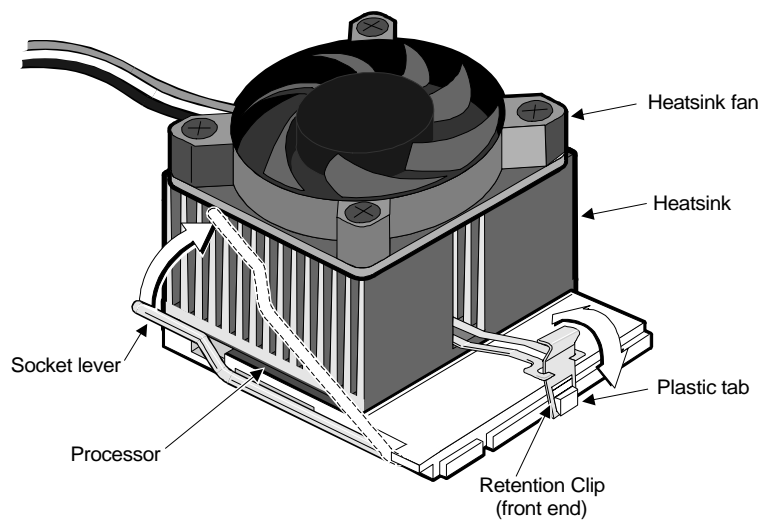
The processor is installed in a 370-pin Plastic Pin Grid Array (PPGA) socket known as a Socket 370. This socket supports Intel® Celeron™ processors with 32KB of integrated Level 1 cache memory (separate 16KB data and instruction caches) and 128KB of on-chip Level 2 cache memory. The processor connects to the rest of the computer via a system, or front-side, bus that runs at 66 or 100MHz.

### **Removing the Processor**

**WARNING:** The processor module and heatsink will be hot if the computer has been running. To avoid personal injury, wait at least 10 minutes for the module and heatsink to cool after turning off the computer.

1. Follow the instructions on page 41 to remove the system cover.
2. Unplug the heatsink fan from the connector on the motherboard.

3. Use care with this step – the heatsink retention clip is installed under tension. Be careful not to let the clip scrape the motherboard, processor or other components. Press down on the front end of the retention clip, then press backwards to release the clip from the plastic tab on the processor socket. Lift up the front end of the clip, then free the other end from its plastic tab.



4. Push the processor socket lever down slightly and then out, and then rotate it up to the vertical open position.
5. Lift the heatsink and processor assembly straight up and out of the computer. Be careful not to touch or bend the pins on the underside of the processor.
6. Separate the heatsink and fan assembly from the processor. The heatsink is attached to the processor with a layer of thermal tape; it may be necessary to use a small screwdriver to separate the processor.
7. Place the processor in an anti-static package.

## **Installing a Processor**

1. Raise the processor socket lever to the vertical open position.
2. Remove the processor from its anti-static package; do not touch the pins on the underside.
3. The corner of the socket closest to pin 1 is identified with a white triangular pointer on the motherboard. The corner of the processor closest to pin 1 is clipped. Align the processor with the socket then lower it into the socket, taking care not to bend the pins.
4. Rotate the socket lever down until it clicks into the horizontal closed position.
5. Remove any old thermal tape still on the heatsink and apply new thermal tape to the top of the processor.
6. With the extended lip of the heatsink toward the back of the socket, center the heatsink/fan assembly over the processor and lower it. The edges of the heatsink extend beyond the edges of the processor and socket.
7. Take care in this step to not scrape the motherboard or components with the retention clip.  
Hook the back end of the retention clip over the plastic tab on the back end of the processor socket.  
Lower the front end of the clip over the heatsink and hook it over the plastic tab on the front of the socket.
8. Plug the heatsink fan into the connector (FAN2) on the motherboard.
9. Follow the instructions on page 42 to replace the system cover

## ***Replacing the RTC Battery{xe “RTC battery”}{xe “CMOS battery”}{xe “Battery”}{xe “Clock battery”}***

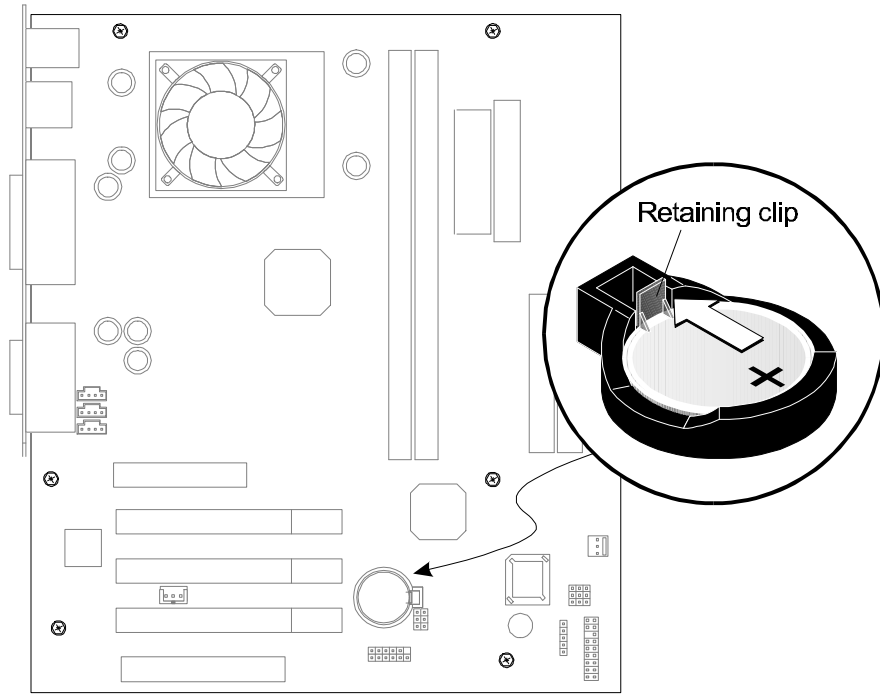
Your computer contains a Real-Time Clock (RTC) that keeps the system time and date accurate to within one minute each month. The RTC also contains memory used by Setup to store its values. The RTC is powered by a coin-cell lithium-ion battery that has an estimated lifetime of five years. When the battery reaches the end of its life, the settings in the RTC memory may be lost and the date and time may become incorrect.

Replacing a battery with an incorrect type can cause an explosion: the replacement battery must be a Sony CR2032 battery or equivalent; this is a 3V Lithium-Ion coin cell battery.

**WARNING:** Do not expose batteries to excessive heat or fire. Keep all batteries away from children. Always discard used batteries according to their manufacturer's instructions.

1. Follow the instructions on page 41 to remove the system cover.

2. Use a small, flat-bladed screwdriver to press the retaining clip on the battery holder and disengage the battery.



3. Remove the battery from its socket, taking care to note the orientation of the "+" and "-" signs on it .
4. Position the new battery in the socket so that its "+" and "-" signs are in the same orientation as the previous battery's.
5. Press the new battery securely into the socket.
6. Follow the instructions on page 42 to replace the system cover



## The Setup Program{xe “Setup”}{xe “Language”}{xe “L2 cache memory”}{xe “Date”}{xe “Time”}

Your computer has a built-in Setup program you use to change the way the computer works. To start Setup, turn on the computer, then press the **Delete** key. You only have a few seconds to do this before the computer starts to load the operating system.

The first screen lists menus from which you make the changes; these menus are described in the following pages. The keys you can use are shown on the lower part of the screen.

### ***Auto-Configuration***

Two of the options are for auto-configuration – they return all of the settings in Setup to one of two sets of default values. *Optimal Settings* uses default values that give maximum performance, but may not work for all applications; *Fail Safe Settings* are default values that give maximum system stability. If you are having configuration problems, choose *Fail Safe Settings*, then change each setting individually for better performance, checking each time that it does not affect stability.

In the following tables describing the Setup menus, † shows the default setting when it is the same for both auto-configuration selections; †<sup>O</sup> shows the optimal settings default and †<sup>F</sup> shows the fail-safe default.

### ***Auto-Detect Hard Drives***

Another option that automatically sets the correct values in Setup is *Auto-Detect Hard Disks*. When you select this option, Setup will test the IDE drives installed, and set the correct values in Setup; the Standard CMOS Setup screen is displayed and shows the values set.

Some older IDE drives may not support auto-detect, in which case, you should enter the drive settings manually.

### ***Exiting Setup***

Two of the options allow you to exit Setup – you can save any changes you’ve made then exit, or you can exit without saving the changes.

## Standard CMOS Setup Menu

Feature	Options	Description
Date	month, day, and year	Sets the system date
Time	hours, minutes, seconds	Sets the system time in the 24-hour format.
Floppy Drive A	720KB 3½ 1.44MB 3¼ 2.88MB 3½ Not installed	Sets the type of diskette drive in your computer. If you have an LS-120 drive, this should be set to <i>Not installed</i> .
Floppy Drive B	720KB 3½ 1.44MB 3½ 2.88MB 3½ Not Installed†	If you install a second diskette drive, set the correct type here.{xe “diskette”}
Pri Master Pri Slave Sec Master Sec Slave	Auto CDROM FLOPTICAL Not Installed 1 – 46 User	If you have run Auto-Detect Hard Drives, the detected values are displayed here.  <i>Auto</i> automatically detects the installed IDE drives each time the computer starts.  <i>CDROM</i> is also used for DVD and CD-RW drives.  <i>FLOPTICAL</i> is used for Zip and SuperDisk drives.  When set to <i>User</i> , you can set the values of the next seven features ( <i>Cyln</i> to <i>PIO Mode</i> ), otherwise these are blank.
Cyln	1 – 16384	Number of cylinders.
Head	1 – 16	Number of read/write heads.
WPcom	1 – 16384	Write Precompensation
Sec	1 – 63	Number of sectors.

<b>Feature</b>	<b>Options</b>	<b>Description</b>
LBA Mode	On Off	This must be <i>On</i> for drives larger than 540MB.
Blk Mode	On Off	Block mode data transfers from the hard disk improve performance but may cause instability.
PIO Mode	Auto 0 – 4	The higher the PIO mode, the better the performance, but only if the drive supports the mode.
32Bit Mode	On† Off	32-bit data transfers improve performance but may cause instability.
Boot Sector Virus Protection	Disabled† Enabled	When enabled, this prevents the boot sector of the hard disk from being changed; if you re-format the hard disk, set this to <i>Disabled</i> .

† – default setting, †<sup>O</sup> – optimal default setting, †<sup>F</sup> – fail-safe default setting

**Advanced CMOS Setup Menu**{xe “Plug and Play O/S”}{xe “Operating system”}{xe “PCI configuration”}{xe “NumLock”}{xe “Advanced menu”}

Feature	Options	Description
1 <sup>st</sup> Boot Device 2 <sup>nd</sup> Boot Device 3 <sup>rd</sup> Boot Device	Disabled IDE-0 IDE-1 IDE-2 IDE-3 Floppy LS-120/ZIP ATAPI ZIP CDROM SCSI NETWORK	Use this to set the order the computer uses to check drives for an operating system when it is turned on.  The default settings depend on which devices are installed.
BootUp Num-Lock	On† Off	Sets the status of the <b>NumLock</b> key when the computer is turned on.
Floppy Drive Swap	Disabled† Enabled	If you have two diskette drives installed, this allows you to swap the drive letters.
Floppy Drive Seek	Disabled† Enabled	If this is enabled, the computer checks the diskette drive for a bootable diskette each time it is turned on. Disabling this ignores the diskette drive, allowing the computer to start faster.
PS/2 Mouse Support	Enabled† Disabled	Enables the built-in PS/2 mouse port.
Initial Display Mode	Absent VGA/EGA† CGA40x25 CGA80x25 Mono	Sets the video mode used to display the power-on messages.

Feature	Options	Description
Password Check	Setup† Always	<i>Setup</i> requires the password to be entered before entering Setup; <i>Always</i> also requires the password to be entered before starting the operating system.
System BIOS Cacheable	Disabled† Enabled	<i>Enabled</i> copies the BIOS to main memory for higher performance.
C000, 64k Shadow	Cached† Disabled Enabled	Reserves 64kB of memory at address C000 for a system cache.
D000, 64k Shadow	Cached Disabled† Enabled	Reserves 64kB of memory at address D000 for a system cache.

† – default setting, †<sup>O</sup> – optimal default setting, †<sup>F</sup> – fail-safe default setting

**Advanced Chipset Setup Menu**{xe “Serial ports”}{xe “COM ports”}{xe “COM2”}{xe “I/O address”}{xe “Interrupts”}{xe “Parallel port”}{xe “Printer port”} \t “See Parallel port”}{xe “USB”}{xe “Bi-directional”}{xe “ECP”}{xe “EPP”}{xe “Audio”}

Feature	Options	Description
USB Keyboard Legacy Support	Disabled† Enabled	Controls support for older USB keyboards.
Display Cache Window Size	64MB† 32MB	Unless you install a different video card that uses less display cache, leave this set to <i>64MB</i> .
Primary IDE cable type	Auto detect† 80 pin cable 40 pin cable	Unless you change the IDE drive data cables, leave this set to <i>Auto detect</i> .
Secondary IDE cable type	Auto detect† 80 pin cable 40 pin cable	Unless you change the IDE drive data cables, leave this set to <i>Auto detect</i> .

† - default setting, †<sup>O</sup> – optimal default setting, †<sup>F</sup> – fail-safe default setting

## Power Management Setup Menu

Feature	Options	Description
ACPI Aware O/S	Yes† No	If you have an operating system that supports ACPI (for example Windows 98), leave this set to <i>Yes</i> .  If you are using Windows NT, set this to <i>No</i> .
Power Management/ APM	Enabled† <sup>O</sup> Disabled† <sup>F</sup>	Enables and disables the built-in power management features
Video Power Down Mode	Suspend† <sup>O</sup> Disabled† <sup>F</sup>	When the computer enters Suspend mode, it puts the monitor into a low-power state.
Hard Disk Power Down Mode	Suspend† <sup>O</sup> Disabled† <sup>F</sup>	When the computer enters Suspend mode, it puts the hard drive into a low-power state.
Suspend Time Out (Minute)	Disabled† 1, 2, 4, 8, 10, 20, 30, 40, 50, 60	Sets the period of system inactivity before the computer enters Suspend mode.
Keyboard & PS/2 Mouse Access	Monitor† Ignore	When set to <i>Monitor</i> , pressing a key or moving the mouse wakes the computer from Suspend mode.
FDC/LPT/ COM Ports Access	Monitor Ignore†	When set to <i>Monitor</i> , using the diskette drive, or a signal from a parallel or serial port device wakes the computer from Suspend mode.
MIDI Ports Access	Monitor Ignore†	When set to <i>Monitor</i> , a signal from a connected MIDI device wakes the computer from Suspend mode.
IDE Access	Monitor Ignore	When set to <i>Monitor</i> , activity on the IDE drive wakes the computer from Suspend mode.
PIRQ IRQ Active	Monitor Ignore†	When set to <i>Monitor</i> , activity on the interrupt wakes the computer from Suspend mode.

<b>Feature</b>	<b>Options</b>	<b>Description</b>
Power Button Mode	Instant Off <sup>†</sup> Delay 4 sec	<i>Instant Off</i> means that the computer shuts down as soon as the power button is pressed.  <i>Delay 4 sec</i> is a safety feature that prevents the computer from being accidentally turned off.
Restore on AC/Power Loss	Power Off <sup>†</sup> Power On Last State	If the AC power is disconnected, this setting determines what the computer does when power is restored
Resume On Ring Header	Enabled Disabled <sup>†</sup>	Enable this to wake up the computer when the modem receives a call.
Resume on LAN Header	Enabled Disabled <sup>†</sup>	Enable this to allow a network administrator to wake up the computer remotely.
PCI Slot PME Function Support	Enabled Disabled <sup>†</sup>	If you install a PCI option card that requires this, you can enable the function. Otherwise, leave this <i>Disabled</i> .
Resume on RTC Alarm	Enabled Disabled <sup>†</sup>	Lets you set a date and time at which the computer will wake up.

<sup>†</sup> - default setting, <sup>†<sup>O</sup></sup> – optimal default setting, <sup>†<sup>F</sup></sup> – fail-safe default setting

### ***PCI/Plug and Play Setup Menu***

<b>Feature</b>	<b>Options</b>	<b>Description</b>
Plug and Play Aware O/S	Yes <sup>†O</sup> No <sup>†F</sup>	Set this to <i>Yes</i> for Windows 98 and <i>No</i> for Windows NT.
Clear NVRAM	No <sup>†</sup> Yes	If install a PCI card that conflicts with the PCI cards already installed, use this to clear the PCI card data.
Primary Graphics Adapter	OnBoard VGA <sup>†</sup> Add-on VGA	Select <i>Onboard VGA</i> to use the built-in video controller; select <i>Add-on VGA</i> if you have installed a PCI video card.
PCI VGA Palette Snoop	Disabled <sup>†</sup> Enabled	Enable this if you install a PCI video card that requires it.
Allocate IRQ to PCI VGA	Yes <sup>†</sup> No	If you install a PCI video card, set this to <i>Yes</i> .
DMA Channel 0, 1, 3, 5, 6, 7	PnP <sup>†</sup> ISA/EISA	Leave these set to <i>PnP</i> .
IRQ3, 4, 5, 7, 9, 10, 11, 14, 15	PCI/PnP ISA/EISA	Leave these set to <i>PCI/PnP</i> .

<sup>†</sup> - default setting, <sup>†O</sup> - optimal default setting, <sup>†F</sup> - fail-safe default setting



## ***Peripheral Setup Menu***

Some of the items on this menu are information on the components installed in the computer and cannot be altered.

<b>Feature</b>	<b>Options</b>	<b>Description</b>
OnBoard AC'97 Audio	Enabled† Disabled	Controls the built-in audio controller.
OnBoard AC'97 Modem	Enabled Disabled†	If you install an AMR card with a modem, enable it here.
Onboard IDE	Both† Disabled Primary Secondary	Controls the built-in IDE drive controller.
OnBoard FDC	Auto† Enabled Disabled	Controls the built-in diskette drive controller.
OnBoard Serial Port A	Auto† 3F8/COM1 2F8/COM2 3E8/COM3 2E8/COM4 Disabled	Controls the built-in serial port.
Onboard Parallel Port	Auto† 378, 278, 3BC Disabled	Controls the built-in parallel port.
Parallel Port Mode	Normal Bi-Dir, EPP ECP†	Specifies the parallel port mode.
Parallel Port IRQ	Auto† 5, 7	Sets the interrupt used by the parallel port.
Parallel Port DMA channel	Auto† 0, 1, 3	For ECP mode only, sets the DMA channel for the parallel port.

<b>Feature</b>	<b>Options</b>	<b>Description</b>
Onboard MIDI Port	Disabled 290, 292, 300 330†	Sets the port number for the built-in MIDI/game port when it is used as a MIDI port.
MIDI IRQ Select	9† 5, 7, 10	Sets the interrupt for the built-in MIDI/game port when it used as a MIDI port.
Onboard Game Port	Disabled 200† 208	Sets the port number to built-in MIDI/game port when it is used to connect to a joystick.
Keyboard PowerOn Function	Disabled† Any Key Specific Key	Selecting <i>Any Key</i> lets you press any key to turn on the computer. <i>Specific Key</i> means that a password must be entered before the computer will turn on.
Specific Key for PowerOn	N/A Password	When <i>Keyboard PowerOn</i> is set to <i>Specific Key</i> , use this to set the PowerOn password.
Mouse PowerOn Function	Disabled† Left-button Right-button	This lets you use the mouse to turn on the computer.

† - default setting, †<sup>O</sup> – optimal default setting, †<sup>F</sup> – fail-safe default setting

## Startup Error Messages and Beep Codes{xe "Troubleshooting"}{xe "Error codes"}{xe "Beep codes"}

When you turn on your computer, before starting the operating system, it goes through a series of power-on self-tests. If any problems are found, the computer displays an error message telling you about them. These messages are explained in the following table.

In some cases, the computer will also let you know what the problem is by making a series of beeps; these beep codes are explained in the table starting on page 77.

### ***Start-Up Error Messages***

Error Message	Explanation
8042 Gate - A20 Error	There is a problem with the keyboard controller. If the keyboard is OK and correctly connected, contact technical support.
Address Line Short!	Error in the address decoding circuitry on the motherboard. Contact technical support.
C: or D: Drive Error C: or D: Drive Failure	Make sure the hard disk is installed correctly, and recognized correctly in Setup. If it is, contact technical support.
Cache Memory Bad, Do Not Enable Cache	Make sure the processor is installed correctly. If it is, contact technical support.
CH-2 Timer Error	You may need to replace the motherboard. Contact technical support.
CMOS Battery State Low	The system clock and CMOS memory are backed up by a battery which is getting low on power; replace the battery (see page 63).
CMOS Checksum Failure	Run Setup.
CMOS System Options Not Set	Run Setup.

<b>Error Message</b>	<b>Explanation</b>
CMOS Display Type Mismatch	Run Setup.
CMOS memory Size Mismatch	Run Setup and make sure the amount of memory listed there matches the amount you have installed.
CMOS Time and Date Not Set	Run Setup and correct the system date and time.
Diskette Boot Failure	Check that the diskette in the drive is inserted correctly. Check the drive is installed correctly (page 50) and is listed correctly in Setup (page 66). If the problem continues, contact technical support.
DMA Error DMA #1 Error DMA #2 Error	You may need to replace the motherboard. Contact technical support.
FDD Controller Failure	Check the diskette drive is installed correctly (page 50) and is listed correctly in Setup (pages 50 and 73). If the problem continues, contact technical support.
HDD Controller Failure	Make sure the hard disk is installed properly (page 50) and that it is correctly identified in Setup (page 66). If the problem continues, contact technical support.
INTR#1 or 2 Error	The motherboard may need to be replaced. Contact technical support.
Invalid Boot Diskette	Try re-inserting the diskette, or use one that is "bootable".
No ROM BASIC	The computer cannot start an operating system on the diskette or hard drive; insert a bootable diskette.
Off Board Parity Error	Make sure the memory modules are installed correctly. If the problem continues, contact technical support.
Parity Error ????	Make sure the memory modules are installed correctly. If the problem continues, contact technical support.

**{xe "Error messages"}{xe "BIOS:error messages"}**

## ***Start-Up Beep Codes{x "Beep codes"}***

If an error occurs when you turn on the computer, you may hear a series of beeps indicating a fatal error.

If you have installed an option card with its own ROM – for example a video card, this may also produce beep codes, usually one long beep followed by others; check in the option card user's guide for details.

<b>Beeps</b>	<b>Explanation</b>
1	Memory refresh failure. Reseat or replace the memory modules (page 46).
2	Memory parity error. Reseat or replace the memory modules (page 46).
3	Base 64K memory failure. Reseat or replace the memory modules (page 46).
4	Timer not operational. Contact technical support.
5	Processor error. Make sure the processor is installed correctly (page 62).
6	8042 - gate A20 failure. Make sure the keyboard is connected correctly.
7	Processor exception interrupt error. Make sure the processor is installed correctly (page 62).
8	Display memory read/write failure. If you are using the built-in video controller, you may need to replace the motherboard. If you are using a video option card, make sure it is installed correctly.
9	ROM checksum error Contact technical support.
10	CMOS shutdown register read/write error. Contact technical support.
11	Cache memory bad. Make sure the processor is installed correctly (page 62).

If there is nothing on screen when you turn on the computer and you do not hear any beeps, check the following:

- Make sure the power cord is connected correctly, and the wall outlet has power
- Make sure the processor and other components on the motherboard are installed correctly
- Remove all option cards. If the system then starts, install the cards one at a time, checking the system after each to determine which card is causing the problem.

## Modem AT Commands{xe "Modem commands"}{xe "AT commands"}

All AT commands must begin with AT and end with you pressing **Enter**. The commands can be in either lower- or upper-case but not mixed.

### Basic AT Commands

A/	Re-execute command	I2	Compute and compare checksum
A	Answer a call	L0	Sets lowest speaker volume
B0	Select v.22 (CCITT) mode at 1200bps	L1	Sets low speaker volume†
B1	Select Bell 212A mode at 1200bps	L2	Sets medium speaker volume
Dn	Dial <i>n</i> when <i>n</i> is 0 – 9, # or *	L3	Sets high speaker volume
DL	Last number redial	M0	Turns speaker off
DP	Pulse dialing	M1	Turns speaker on during handshaking, off afterwards†
DT	Touch tone dialing†	M2	Turns speaker on during handshaking and receiving carrier, off afterwards
DW	Wait for a second dial tone	M3	Turn speaker off during handshaking and receiving carrier, on afterwards
D,	pause	N0	Turn automode detection off
D@	Wait for 5 seconds of silence	N1	Turn automode detection on†
D!	flash	O0	Go on-line
D;	Return to Command Mode after dialing	O1	Go on-line and initiate training
D\$	Bong tone detection (for credit card calls)	P	Force pulse dialing
DS= <i>n</i>	Dial one of four stored telephone numbers ( <i>n</i> = 0 – 3)	Q0	Modem sends responses†
E0	Turn off command echo	Q1	Modem does not send responses
E1	Turn on command echo†	Sr?	Display the value of register <i>n</i>
H0	Hang up	Sr= <i>n</i>	Set the value of register <i>r</i> to <i>n</i>
H1	Enter command mode	T	Force tone dialing†
I0 or I3	Report firmware revision, model and interface type	V0	Numeric responses

I1	Compute and report checksum	V1	Word responses†
W0	Report DTE speed)	X2	Report basic call progress result codes and connection rates(OK, CONNECT, RING, NO CARRIER, NO ANSWER, CONNECT xxx, No DIAL TONE and ERROR)
W1	Report line speed, EC protocol and DTE speed	X3	Report basic call progress result codes and connection rates(OK, CONNECT, RING, NO CARRIER, NO ANSWER, CONNECT xxx, BUSY and ERROR)
W2	Report DTE speed in EC mode	X4	Report all call progress result codes (OK, CONNECT, RING, NO CARRIER, NO ANSWER, CONNECT xxx, BUSY, No DIAL TONE and ERROR)†
X0	Report basic call progress result codes (OK, CONNECT, RING, NO CARRIER, NO ANSWER and ERROR)	Y0	Modem does not send or respond to break signals.
X1	Report basic call progress result codes and connection rate (OK, CONNECT, RING, NO CARRIER, NO ANSWER, CONNECT xxx and ERROR)	Z0	Restore stored profile 0 after warm reset

† - default setting



## Extended AT Commands

&C0	Force Carrier Detect signal high†	&K4	Enable XON/XOFF DTE/DCE flow control
&C1	Turn on CD when remote carrier is present	&M0	Select direct asynchronous mode
&D0	Ignore the DTR signal†	&S0	DSR is always active†
&D1	Return to Command Mode after DTR toggle	&S1	DSR off in Command Mode, on in on-line mode
&D2	Hang up and return to Command Mode after DTR toggle	&T0	Terminate any test in progress
&D3	Reset modem after DTR toggle	&T1	Initiate local analog loopback test
&Fn	Restore factory configuration <i>n</i>	&T3	Initiate local digital loopback test
&G0	Disable guard tone†	&V	Display current configurations
&G1	Enable 550Hz guard tone	&W0	Store the active profile in NVRAM profile 0
&G2	Enable 1800Hz guard tone	&Y0	Recall stored profile 0 on power up†
&K0	Disable DTE/DCE flow control	&Z <i>n</i> = <i>x</i>	Store dial string <i>x</i> (to 34) in location <i>n</i> (0 to 3)
&K3	Enable RTS/CTS DTE/DCE flow control†		

† - default setting

## MNP, v.42 and v.42bis AT Commands

%C0	Disables data compression	\N0	Normal speed buffered mode
%C1	Enable MNP5 data compression	\N1	Direct data link mode
&Q0	Same as \N0	\N2	v.42 or MNP mode only
&Q5	Same as \N3	\N3	v.42, MNP or normal mode only†
&Q6	Same as \N0	\N4	v.42 mode only
		\N5	MNP mode only

† - default setting

***Fax Class 1 Commands{xe "Fax commands"}***

+FCLASS= <i>n</i>	Service class	+FTH= <i>n</i>	Transmit data with HDLC framing
+FRH= <i>n</i>	Receive data with HDLC framing	+FTM= <i>n</i>	Transmit data
+FRM= <i>n</i>	Receive data	+FTS= <i>n</i>	Stop transmission and wait
+FRS= <i>n</i>	Receive silence		

## Specifications

### Dimensions{xe "Dimensions"}{xe "Weight"}

Height x Depth x Width: 14.8 x 16.8 x 7.1" (371 x 432 x 180mm)

Weight: typical: 18lbs (8.2kg), maximum: 23lbs (10.4kg)

### Power Supply{xe "Power supply"}

95W power supply, switchable voltage:

- 115VAC (90 to 137VAC): 47 to 63Hz, 3A
- 230VAC (180 to 265VAC): 47 to 63Hz, 1.5A

### Environment{xe "Temperature"}{xe "Humidity"}{xe "Altitude"}

	Operating	Non-operating
Temperature	32 to 95°F (0 to 35°C)	-4 to 140°F (-10 to 60°C)
Humidity	20 to 80% (non-condensing)	10 to 90% (non-condensing)
Altitude	0 to 10,000feet (0 to 3,000m)	-200 to 30,000feet (-60 to 9,090m)

### Processor {xe "Processor"}{xe "CPU"}{xe "Cache memory"}{xe "L1 cache memory"}{xe "L2 cache memory"}{xe "Pentium III processor"}{xe "SEP"}{xe "SECC"}{xe "SECC2"}

The processor is installed in a 370-pin Plastic Pin Grid Array (PPGA) socket known as a Socket 370. This socket supports Intel® Celeron™ processors with 32KB of integrated Level 1 cache memory (separate 16KB data and instruction caches) and 128KB of on-chip Level 2 cache memory.

At the time of printing this user guide, the processors were available with 500, 466, 433 and 400 MHz core frequencies and a 66MHz front-side bus (FSB).

### **Architecture{xe "System controller"}{xe "AGP"}**

The computer features the Intel® 810 chipset, a highly-integrated chip-set optimized for Intel® Celeron™ processors that includes the following components:

- 82810 Graphics and Memory Controller Hub (GMCH) that connects to the processor through a 66 or 100MHz front-side bus. The GMCH features an integrated memory controller for 64-bit, 66 or 100MHz SDRAM and an integrated 2D/3D graphics controller.
- 82801 I/O Controller Hub (ICH) that integrates a 33MHz PCI bus controller, power management support, an ATA/66 hard disk drive controller, a USB controller, a System Management Bus (SMBus) controller, and an AC '97 2.1 compliant link for audio and telephony.
- Firmware Hub (FWH) that stores the system and video BIOS

### **Memory{xe "Memory"}{xe "DIMMs"}{xe "SDRAM"}**

Two DIMM sockets that accept 66 or 100MHz unbuffered SDRAM modules with 32, 64, 128 or 256MB of memory. The DIMM modules must be gold-plated, with 168 pins and use 3.3V.

### **Video**

The GMCH integrates a Direct AGP graphics controller with a 3D hyper-pipelined architecture, full 2D hardware acceleration and hardware motion compensation for software MPEG-2 decoding. The GMCH uses Dynamic Video Memory Technology to provide efficient utilization of system memory for display, texture and Z-buffers.

Resolutions: 640x480, 800x600, 1024x768, 1280x1024, 1600x1200

Colors: 256 (8-bit), 64 thousand (16-bit) and 16 million (24-bit)

Refresh rates: 60, 72, 75 and 85Hz (non-interlaced)

### **Audio**

The ICH integrates an audio controller that supports software audio.

### **Expansion Buses**

PCI: three 33MHz, PCI rev. 2.2 compliant slots

AMR: one slot for a card containing modem codecs

**Integrated Ports{xe "Connectors"}**

**Audio:** Stereo line in, Stereo line out, Microphone in

**Keyboard:** PS/2-compatible connector

**MIDI/Game Port:** supports standard game devices such as joysticks and game pads. When MIDI software is loaded, the port also supports MIDI devices.

**Mouse:** PS/2-compatible connector

**Parallel:** 25-pin, female D-shell connector, multimode parallel interface, supports output only, bi-directional, ECP and EPP modes

**Serial:** 9-pin, mini-DIN connector, high-speed, 16550-compatible RS232C

**USB:** two connectors for USB devices

**Video:** 15-pin, female D-shell, VGA connector

**Diskette Drive{xe "Diskette drive"}{xe "SuperDisk drive"}**

The computer has one of the following diskette drives:

- 1.44MB, 3.5" diskette drive accepts DD (720KB) or HD (1.44MB) diskettes
- LS-120 (SuperDisk) drive accepts DD (720KB), HD (1.44MB) or SD (120MB) diskettes.

**Hard Disk{xe "Hard disk drive"}{xe "S.M.A.R.T."}**

The ICH supports ATA/33 and ATA/66 hard disks. At the time of printing this manual, the following drives were available:

4 and 8GB: 5400 rpm;

13.6, 20.4 and 28.5GB: 7200rpm.

**Optical Drive{xe "Optical drive"}{xe "CD-ROM drive"}{xe "DVD drive"}{xe "CDR-W drive"}**

The computer has one of the following optical drives:

- Acer 40x (max.) CD-ROM drive with ATAPI interface, supports audio CD, CD multisession, CD-i, Photo CD, enhanced CD, CD-R and CD-RW
- Sony CRX100E/CH 4x (max.) write (CD-R), 2x (max.) write (CD-RW) and 24x (max.) read CD-RW drive with ATAPI interface, supports audio CD, CD multisession, CD-i, Photo CD, enhanced CD, CD-R and CD-RW
- Hitachi GD-2500 BX 3<sup>rd</sup> generation DVD-ROM drive with ATAPI interface, supports 24x (max.) CD access, including audio CD, CD multisession, CD-i, enhanced CD, CD-R and CD-RW; supports 6x (max.) DVD access, including DVD-5, -9 -10 and -18 disks

**Modem (option){xe "Modem"}**

AMR or PCI card supporting line speeds up to 56kbps (download) and 33kbps (upload) with error correction and data compression:

- ITU-T v.90, v.34+, v.34, v.32bis, v.32, v.29, v.27ter, v.23, v.22bis, v.22, v.17 data transmission; Bell 212A and 103 modes
- ITU-T v.80 videophone
- ITU-T v.70 DSVD
- ITU-T v.42 LAPM and MNP2, 3 and 4 error correction
- ITU-T v.42bis and MNP5 data compression
- Fax send and receive using ITU-T v.17 (14,400bps), v.29 (9600/2400bps), v.27ter (4800/2400bps) and v.21 channel 2 (300bps) protocols, and the EIA 578 Class 1 AT command set.

**Network Card (option){xe "Network card"}{xe "Ethernet card"}{ XE "LAN:card" }**

PCI card SMC EZ Card SMC1211TX 10/100BaseT Fast Ethernet card with Wake on LAN support

**Zip Drive{xe "Zip drive"} (option)**

Zip drive with ATAPI interface accepts 100MB Zip disks

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## **Regulatory Notices**

### ***FCC Emission Notices For Users in the USA***

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to Part 15 of FCC Rules. These rules are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates uses and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, you are encouraged to correct the interference with one or more of the following measures:

- Reorient the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the an experienced radio/TV technician for help.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits.

Caution: unauthorized changes or modifications may void the user's right to operate the equipment. Operation is subject to the following two conditions: U) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

### ***FCC Emission Notices For Users in Canada***

This Class B digital apparatus meet all of the requirements of the Canadian Interference-Causing Equipment Regulations.

Cet Appareil numerique de la class B respecte toutes les exigences du reglement sur le materiel brouilleur do Canada.

## **Part 68 Notices**

This equipment complies with Part 68 of the FCC rules.

Model number: F-1156IV/A2  
FCC Registration Number: DK4DF1156IVA2  
Ringer Equivalence Number (REN): 0.4

If requested, this REN must be given to your telephone company. The REN is used to determine the quantity of devices you may connect to your telephone line and still have those devices ring when your number is called. In most, but not all areas, the sum of all RENs of all devices should not be more than five (5.0). To be certain of the number of devices you may connect to your line, as determined by the total number of RENs, you should call your local telephone company to determine the maximum number of RENs for your calling area.

If the telephone company suspects a problem with your telephone line is related to an add-on electronic device, such as your modem, they have the right to temporarily suspend your service. It is your responsibility to remove from the telephone line any malfunctioning electronic communications equipment to avoid damage to the telephone system.

If your equipment causes harm to the telephone network, the telephone company may discontinue your service temporarily. If possible, they will notify you first. But if advance notice is not practical, you will be notified as soon as possible. You will be informed of your right to file a complaint with the FCC. Your telephone company may make changes to its facilities, equipment, operations or procedures that could affect the proper functioning of your equipment. If they do, you will be notified in advance to give you an opportunity to maintain uninterrupted telephone service.

The telephone company may ask that you disconnect this equipment from the network until the problem has been corrected or until you are sure that the equipment is not malfunctioning.

This equipment may not be used on coin service provided by the telephone company. Connection to party lines is subject to state tariffs.

If you experience trouble with this telephone equipment, please contact your place of purchase for information for obtaining service or repairs.

## ***Laser Compliance Statement***

The optical drives used in the computer are laser products. The optical drives' classification labels are located on top of the drives.

CLASS I LASER PRODUCT  
LASER KLASSE I  
LUOKAN I LASERLAITE  
APPARER A LASER DE CLASSE 1  
KLASS I LASER APPARAI

The optical drives are certified in the US to conform to the requirements of the Department of Health and Human Services 21 Code of Federal Regulations (DHHS 21 CFR) Subchapter 3 for Class 1 laser products.

In other countries, the drives are certified to meet the requirements of EN60825.

**Caution:** Do not open the drive; no user adjustments or serviceable parts are inside. Use of the controls, adjustments or the performance of procedures other than those specified may result in hazardous radiation exposure.

Class 1 laser products are not considered hazardous. The optical drives have an internal, Class 1 (1), 0.5 milliwatt, aluminum-gallium-arsenide laser that operates at a wavelength of 760 to 810 nanometers. The design of the laser system and the optical drives ensure that there is no exposure to laser radiation above a Class 1 (1) laser during normal operation, user maintenance or servicing conditions.

## ***Declaration of the Manufacturer or Importer***

We hereby certify that this product is in compliance with EU Directive 89/336/EEC, using the EMC standards EN55022B.

## ***Product Safety Compliance***

This equipment meets or exceeds requirements for safety in the US (UL 1950), Canada (CSA C22.2 No. 950-95), and Europe (TUV to EN60950). This equipment has been tested and verified to meet the CISPR 22 Class B requirements.



## Important Information

Serial Number:	_____
Date Purchased:	_____
Processor:	_____
Memory:	_____
Hard Drive:	_____
Optical Drive:	_____
SuperDisk or Zip Drive:	_____
Modem card:	_____
Network card:	_____
Option card:	_____
	_____
	_____
System BIOS Date :	_____
Operating System:	_____
Other Software:	_____
	_____
	_____
Printer:	_____

